Preparers and Reviewers

Prepared by: _____ Date: 17Jul18
Jason Ross
Planning and Environmental Specialist

Prepared by: _____ Date: 7/17/18
Alison McCartney
Wildlife Biologist

Prepared by: _____ Date: 7-17-18
John Sullivan
Archaeologist/Tribal Coordinator

Prepared by: _____ Date: 7-19-18
Bill Bagnall
Petroleum Geologist

Reviewed by: _____ Date: 7/23/18
Sally Spencer
Acting District Manager, Southeastern States District Office

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Southeastern States District Office
273 Market Street
Flowood, Mississippi 39232

Environmental Assessment
ES-020-2018-24

EOI #2182a, Smith County, Mississippi
Lease EA

July 23, 2018

Table of Contents

Tables

LIST OF APPENDICES

EXECUTIVE SUMMARY

Proposed Action. The Proposed Action is to lease 79.70 acres of federal minerals located in Smith County, Mississippi for potential future oil and gas development. The lease parcel evaluated as part of the Proposed Action consists of federal mineral estate underlying private surface and is assigned Expression of Interest (EOI) #2182a. The proposed lease would provide the lessee exclusive rights to explore and develop oil and gas reserves on the lease, but does not in itself authorize surface disturbing activities at this stage. Although there would be no surface disturbance from the action of leasing, this Environmental Assessment (EA) analyzes a reasonably foreseeable development (RFD) scenario to address the anticipated environmental effects from potential future oil and gas development that are considered reasonably foreseeable, but unknown in specific detail at this time. Before a lease owner or operator conducts any surface disturbing activities related to the development of this lease to access the federal minerals, the Bureau of Land Management (BLM) must first approve an application for permit to drill (APD) as specified in Title 43 Code of Federal Regulations (CFR) 3162. In an APD, an applicant proposes to drill the well subject to the terms and conditions of the lease. Upon receipt of an APD, the BLM conducts an onsite inspection with the applicant and preferably, the private landowner or surface management agency. The BLM would also conduct additional site-specific analysis in compliance with the National Environmental Policy Act (NEPA) and appropriate consultations prior to approving the APD. The RFD scenario projects approximately 8.61 acres of surface disturbance from potential future oil and gas development associated with the proposed leasing action.

Purpose and Need. The purpose of the Proposed Action is to respond to the EOI in support of development of oil and natural gas resources that are essential to meeting the nation's future needs for energy while minimizing adverse effects to natural and cultural resources. The BLM minimizes adverse effects to resources by identifying appropriate lease stipulations and notices, best management practices, and mitigations. It is the policy of the BLM as mandated by various laws, including the Mineral Leasing Act of 1920, as amended (30 United States Code [USC] 181 et seq.), the Federal Land Policy and Management Act of 1976 (FLPMA), and the Energy Policy Act of 2005 to make mineral resources available for development to meet national, regional, and local needs. The oil and gas leasing program managed by the BLM encourages the sustainable development of domestic oil and gas reserves which reduces the dependence of the United States on foreign sources of energy as part of its multiple-use and sustainable yield mandate.

The leasing of federal minerals is vital to the United States oil and gas industry as it seeks to maintain adequate domestic production of this strategic resource. The industry uses the BLM EOI process to nominate federal minerals for leasing. The Proposed Action is therefore needed to respond to EOI #2182a, consistent with the BLM's mission and requirement to evaluate nominated parcels and hold quarterly competitive lease sales for available oil and gas lease parcels.

Environmental Impacts. The anticipated environmental impacts of the Proposed Action and No Action Alternative are summarized in Appendix A, Table ES-1.

1.0 CHAPTER 1 – PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The Bureau of Land Management (BLM) has prepared this Environmental Assessment (EA) to evaluate the anticipated environmental impacts of leasing 79.70 acres of federal mineral estate to support potential future oil and gas development in Smith County, Mississippi (Appendix B, Figure 1-1). Interested parties such as private individuals or companies may file Expressions of Interest (EOIs) to nominate parcels for competitive bid and leasing by the BLM. The BLM Eastern States is required to hold quarterly competitive lease sales to sell available oil and gas lease parcels.

The parcel evaluated as part of the Proposed Action consists of federal mineral estate underlying privately owned land. A federal lease is a legal contract that grants exclusive rights to the lessee to develop federally-owned oil and gas resources but does not authorize surface-disturbing activities or obligate the lessee to drill a well on the parcel in the future. Should the parcel be leased and a detailed plan for oil and gas development on the parcel be identified, the BLM would conduct future site-specific environmental analysis prior to any ground disturbing activities. The Proposed Action evaluated in this EA is described in further detail in Chapter 2.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), the United States Department of the Interior (DOI) NEPA requirements (Department Manual 516, Environmental Quality) and the BLM NEPA Handbook H-1790-1. The information presented within this document serves as the basis for the BLM Authorized Officer to decide whether implementation of the Proposed Action would result in a significant impact to the environment. If significant impacts are expected, then the BLM would prepare an Environmental Impact Statement (EIS). If no significant impacts are expected, the BLM would issue a Finding of No Significant Impact (FONSI).

1.2 Location of the Proposed Action

EOI #2182a is located in Smith County, Mississippi and contains 79.70 acres. The proposed project site is located at: T. 4N., R. 8E., Sec. 29 NENE, SENE (Appendix B, Figure 1-1).

1.3 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to respond to the EOI in support of the development of oil and natural gas resources that are essential to meeting the nation's future needs for energy, while minimizing adverse effects to natural and cultural resources. The BLM minimizes adverse effects to resources by identifying appropriate lease stipulations and notices, best management practices, and mitigations. It is the policy of the BLM as mandated by various laws, including the Mineral Leasing Act of 1920, as amended [(30 United States Code [USC] 181 et seq.), the Federal Land Policy and Management Act of 1976 (FLPMA), and the Energy Policy Act of 2005 to make mineral resources available for development to meet national, regional, and local needs. The oil and gas leasing program managed by the BLM encourages the sustainable development of domestic oil and gas reserves which reduces the dependence of the United States on foreign sources of energy as part of its multiple-use and sustainable yield mandate.

The leasing of federal minerals is vital to the United States oil and gas industry as it seeks to maintain adequate domestic production of this strategic resource. The industry uses the BLM EOI process to nominate federal minerals for leasing. The Proposed Action is therefore needed to respond to EOI #2182a consistent with the BLM's mission and requirement to evaluate nominated parcels and hold quarterly competitive lease sales for available oil and gas lease parcels.

1.4 Land Use Plan Conformance and Decision to be Made

The Proposed Action does not conflict with any known state or local planning or zoning law, regulation, policy or ordinance. This EA is produced in conformance with the BLM Mississippi/Alabama Resource Management Plan and will be used as a basis for making a decision on the Proposed Action.

The BLM's policy is to promote oil and gas development if it meets environmental and natural resources management and planning guidelines and regulation standards set forth by NEPA and other subsequent laws and policies of the United States (Appendix C). Therefore, the BLM must decide whether to lease the nominated parcel and if so, under what terms and conditions (Appendix D contains the proposed lease stipulations).

1.5 Scoping and Public Involvement

1.5.1 Internal Scoping

A BLM interdisciplinary team consisting of a Planning and Environmental Specialist, Wildlife Biologist, Archaeologist, and Geologist reviewed the EOI and prepared the EA. The interdisciplinary team used various sources of information to prepare the EA, including existing data inventories, online resources, and information collected onsite. Documentation of the physical site characteristics and site conditions relied on aerial imagery, United States Geologic Survey (USGS) topographic mapping, and a reconnaissance site visit on June 6, 2018. No major issues of concern were identified during internal scoping.

1.5.2 External Scoping

The BLM conducted and completed the required informal consultation with the United States Fish and Wildlife Service (USFWS) in compliance with the ESA Section 7 consultation requirements. The BLM also conducted and completed the required consultation with the Mississippi State Historic Preservation Office (SHPO) and Native American tribes. The BLM initiated informal consultation with USFWS on June 7, 2018. A no-effect concurrence letter was received on June 27, 2018 and is located in Appendix E. Consultation with the SHPO and coordination with the tribes occurred on February 22, 2018. The BLM received a concurrence letter from SHPO on March 19, 2018 (Appendix E).

A response was received from the Choctaw Historic Preservation Office on March 23, 2018 stating they were unaware of any Traditional Cultural Property (TCP) presence on the parcel and requested tribal consultation prior to ground disturbing activities. Cultural resource studies are warranted prior to approval of any development proposals.

The Mississippi State Historic Preservation Program and the following tribes were contacted to notify them of the Proposed Action and to request comments or concerns:

Alabama-Coushatta Tribe of Texas
Alabama Quassarte
Choctaw Nation
Coushatta Indian Tribe
Jena Band of Choctaw
Kialagee Tribal Town
Mississippi Band of Choctaw
Thlopthlocco Tribal Town
Tunica-Biloxi Tribe of Louisiana
Muscogee (Creek) Nation

All agency and tribal correspondence is included in Appendix E of this EA.

1.5.3 Public Involvement

The BLM invites public participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables more informed decision-making. All agencies, organizations, and members of the public having a potential interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, are encouraged to participate in the decision making process.

Although not required, typically, leasing EAs are made available for a 30-day review period. Additionally, the lease sale notice is posted to the BLM Eastern States and the National NEPA Register project webpages at least 45 days prior to the sale as required. Posting of the lease sale notice initiates a 10-day protest period for the proposed lease sale parcel.

2.0 CHAPTER 2 – DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The CEQ's *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* establish a number of policies for federal agencies, including "using the NEPA process to identify and assess reasonable alternatives to the Proposed Action that would avoid or minimize adverse effects of these actions on the quality of the human environment" (40 CFR 1500.2 (e)). This chapter provides a detailed description of the Proposed Action and alternatives carried forward for analysis in the EA.

2.1 Proposed Action

The Proposed Action is to lease 79.70 acres of federal minerals located in Smith County, Mississippi for potential future oil and gas development. The proposed lease would provide the lessee exclusive rights to explore and develop oil and gas reserves on the lease, but does not in itself authorize surface disturbing activities. Before a lease owner or operator conducts any surface disturbing activities related to the development of this lease to access the federal minerals, the BLM must first approve an application for permit to drill (APD) as specified in Title 43 CFR 3162. In an APD, an applicant proposes to drill the well subject to the terms and conditions of the lease. Upon receipt of an APD, the BLM conducts an onsite inspection with the applicant and preferably, the private landowner or surface management agency. The BLM also conducts additional site-specific NEPA analysis and the appropriate consultations under the ESA and NHPA prior to approving the APD. Although there would be no surface disturbance from the action of leasing, this EA analyzes a reasonably foreseeable development (RFD) scenario to address the potential environmental effects from potential future oil and gas development that are considered reasonably foreseeable, but unknown in specific detail at this point in time. For example, estimates are projected for the likely number of wells to be constructed; however, well locations may change at the APD stage. BLM issues oil and gas leases for an initial 10-year period. These leases continue thereafter as long as oil or gas is produced in paying quantities. If a lessee fails to produce oil and

gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease, then ownership of the minerals reverts to the federal government.

2.1.1 RFD Scenario for Potential Oil and Gas Development for EOI #2182a.

EOI #2182a totaling 79.70 acres consists of federally owned mineral estate underlying privately owned surface (split-estate). Reasonably foreseeable activities that could occur as a result of future oil and gas development associated with leasing this parcel include surface disturbance associated with preparation for drilling including construction of a road, drilling pad, and reserve pit (Table 2.1). Federal minerals will be incorporated post-leasing into a larger state-determined drilling and production unit. The total surface disturbance predicted under the RFD scenario is approximately 8.61 acres, which includes projected surface disturbance associated with well pad and pit (approximately 7.58 acres) and construction of access roads (approximately 1.03 acres) (Appendix F). The RFD scenario projects that one vertical well would be drilled from 1 well pad.

Table 2.1 RFD Scenario Disturbances (acres) for Mississippi EOI #2182a.

File #	State and County	EOI Acres	Access Roads	Well Pad and Pit	Utility and/or Pipeline ROW	Initial Disturbance	Partial Reclamation	Net Disturbance
EOI 2182a	MS, Smith County	79.70	1.03	7.58	0 –Use access rd ROW	8.61	0.34	8.27

2.2 No Action Alternative

Under the No Action Alternative, the BLM would not offer for competitive bid or lease the proposed 79.70 acres of federal mineral estate for potential future oil and gas development. Not leasing EOI #2182a would not meet the purpose of and need for the Proposed Action. CEQ guidelines (40 CFR 1502) stipulate that the No Action Alternative should be analyzed to assess any environmental consequences that may occur if the Proposed Action is not implemented and to serve as a baseline for comparing impacts of the Proposed Action. Therefore, the No Action Alternative has been retained for analysis in this EA.

2.3 Alternatives Considered but Dismissed

EOI #2182a contains 79.70 acres; however, BLM did not consider any other alternatives aside from the Proposed Action and the No Action Alternative. However, prior to signing the Decision Record, the BLM Authorized Officer will make a determination on whether this parcel would be offered for lease, based on the analysis presented in this EA.

3.0 CHAPTER 3 – DESCRIPTION OF THE AFFECTED ENVIRONMENT

This chapter describes the environment that would potentially be affected by implementation of the Proposed Action, as required by CEQ regulations for implementing NEPA (40 CFR Parts 1500-1508). The discussion in this chapter focuses on the relevant resources and issues and only those elements of the affected environment that have the potential to be affected are described in detail.

Based on a review of the context and scale of the Proposed Action, the following resources are discussed in detail in this EA: Land Use, Noise Resources, Socioeconomics, Cultural Resources and Native American Concerns, Minerals and Mineral Development, Wastes, Soils, Air Resources, Water Resources – Surface/Ground Water, Wetlands/Riparian Areas/Floodplains and Natural Resources including; Invasive/Exotic Species, Vegetation and Wildlife, Special Status Species, Migratory Birds of Concern, Public Health and Safety, and Transportation.

The following resources have been eliminated from further discussion from the EA, because either the resource is not present or there are no anticipated effects to the resource. A brief summary explaining why the resource was eliminated is also provided below.

- Lands with Wilderness Characteristics, Areas of Critical Environmental Concern, Wilderness Study Areas, Wild and Scenic Rivers. None of these resources are present on or in the immediate vicinity of the proposed lease parcel.
- Recreation. The proposed parcel is located on commercial private property (a sawmill).
- Visual. The lease parcel is not visible to the public and any future mineral development would not appreciably alter or degrade the current visual environment.
- Environmental Justice. Based on U.S. Census Bureau data (2016), there is no evidence of environmental justice population presence in Smith County, MS. Less than one-half of the population of Smith County is of minority or low-income status (23.7%). The percentage of minority or low-income status in Smith County (18.9%) is less than 10% higher than for the state of Mississippi (20.8%).
- Public Health and Safety and Transportation. The proposed parcel is located on a commercial private property (a sawmill) with no exposure for the public. Commercial traffic of heavy equipment is constant in supplying logs to the sawmill. Any increase in large, heavy vehicle traffic resulting from future mineral development would be negligible and not cause an appreciable increase in noise, dust, or soil compaction.

3.1 Land Use

EOI #2182a

EOI #2182a is almost entirely composed of a commercial sawmill wood storage yard surrounded by a forested fringe of woodland. The nearest water body consists of four ponds on the property (Appendix B, Figures 3-1, 3-2). EOI #2182a is located about 1 mile southeast of Lorena, Mississippi, east of State Highway 35. The nearest larger town and county seat is located ~10 miles south of EOI #2182a, Raleigh, Mississippi (population 1,462 in 2010 U.S. Census Bureau).

The surrounding area within a two-mile buffer exhibits typical land use patterns in the Southeastern Plains ecoregion. This use pattern consists of a complex combination of farmland, pastureland, woodland, and forest resulting from dissected, irregular plains and gently rolling hills composed of Cretaceous and Tertiary aged sands, silts, and clays occurring in east-west bands across the region. Forested woodland occupies slopes along drainages with cleared fields for agriculture and pastureland occupying flatter, more level terrain. Presently, landcover is mostly wooded with frequent, scattered open agricultural areas (Appendix B, Figures 3-1, 3-2).

3.2 Noise Resources

The noise environment of the parcel and adjacent area is consistent with a rural, agricultural,

industrial environment. EOI #2182a currently contains a wood-storage yard for an adjacent commercial sawmill located on the west parcel border with an associated elevated industrial noise environment. Levels of noise are measured in units called decibels (dB). Construction equipment generates between 70 and 115 decibels (dB). Typical noise associated with oil and gas activities include the actual drilling, the pumps (that extract the oil), the engines, the compressor and the vehicle traffic to and from the site. Noise associated with oil and gas development typically continues non-stop for 30 days for each well that is constructed, but after this initial development period, noise levels are expected to subside. Any increase in noise levels resulting from future mineral development would not cause an appreciable increase in noise on EOI #2182a. No noise ordinance exists for rural areas of Smith County, Mississippi.

3.3 Socioeconomics

Smith County, Mississippi consists of 636.25 square miles (U.S. Census Bureau: State and County Quick Facts, 2010). The 2016 county population was an estimated 15,909, which is a 3.5% decrease from the 2010 census. The median household income in 2012 – 2016 was $33,696.00. Smith County had 171 employer establishments in 2016 with 2,300 people employed (U.S. Census Bureau: State and County Quick Facts, 2016).

Table 3-1. Socioeconomic data (2010-2016) for Smith County, Mississippi.

County	**Sq. Miles**	**2010 Population**	**2016 Population, Change from 2010**	**Median Annual Income ($)**	**Poverty Level (%)**
Smith	636.25	16,493	15,909	33,696	18.9
Mississippi (State)	46,923.27	2,967,297	2,988,726	40,528	20.8

(U.S. Census Bureau: State and County Quick Facts, 2010-2016).

3.4 Cultural Resources and Native American Concerns

A cultural resource is a broad term that refers to areas of traditional significance, use and the remains of past and current human activity. These resources may be the physical remains of a prehistoric or historic archeological site or a place of traditional cultural significance or use. A Traditional Cultural Property (TCP) refers to the connection between places on the landscape and a group's traditional beliefs, religion, or cultural practice. Because cultural resources are nonrenewable and easily damaged, laws and regulations exist to help protect them.

The NHPA, as amended, and its implementing regulations require that federal agencies consider the effects of their undertakings on "historic properties." The term "historic properties" refers to cultural properties, both prehistoric and historic, that are eligible for listing in the National Register of Historic Places (NRHP). Traditional sacred places and traditional use areas of tribes are also considered cultural historic properties that may be eligible for the NRHP, because of their association with cultural practices and beliefs rooted in history and their importance in maintaining the cultural identity of ongoing American Indian communities. Consultations about these uses and

places are governed and/or mandated by the NHPA, as amended in 1992 (USC 470 et seq.), the American Indian Religious Freedom Act of 1978 (42 USC 1996), the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001 et seq.) and EOs 13007, 13175, 13084, and 13647. Federal agencies consider the effects of their management activities on historic properties by first determining the area of potential effect, then conducting literature searches and field surveys to locate cultural properties. Additionally, they consult with Native American Indian Tribes and other interested parties to determine whether TCPs are within the area of potential effect.

Federally recognized Native American tribes have been contacted about this proposed undertaking (see Section 1.8.2). Known sites of Native American religious activities have not been located. Literature reviews indicate this lease parcel does not have recorded historic or cultural resources. Religious sites or sites of cultural importance to Native Americans may be present. The proposed lease area may have undiscovered sites that would qualify as historic properties (36 CFR 61). A professionally conducted survey for historic properties at the APD stage would add information on human utilization of this area.

3.5 Minerals and Mineral Development

The objective horizons for EOI #2182a are the Jurassic Cotton Valley and Smackover between 14,500' and 17, 500'. The commodity is crude oil and associated natural gas. The well for EOI #2182a would be drilled vertically or with a slight deviation. Wells drilled in these formations do not require hydraulically fracturing or "fracking" in order to establish commercial production.

3.6 Wastes

The Resource Conservation and Recovery Act (RCRA) of 1976 established a comprehensive program for managing hazardous wastes from the time they are produced until their disposal. On January 6, 1988, USEPA determined that oil and gas exploration, development and production wastes would not be regulated as hazardous wastes under the RCRA. The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, deals with the release (spillage, leaking dumping, accumulation, etc.), or threat of release of hazardous substances into the environment. Despite many oil and gas constituent wastes being exempt from hazardous waste regulations, certain RCRA exempt contaminants could be subject to regulations as a hazardous substance under CERCLA.

No hazardous or solid waste disposal sites are located on the proposed lease parcel. Should the parcel be leased and the federal minerals developed, generation and temporary storage of waste materials (solid and liquid) would likely occur near the lease parcel.

3.7 Soils

A mixture of four fine sandy loam soil types are located on EOI #2182a. Smithdale fine sandy loam, 8 to 35 percent slopes, comprises approximately 60% of the parcel. Ora fine sandy loam, 2-8 percent slopes, makes up approximately 18% of the parcel. Savannah and Sweatman fine sandy loams each make up approximately 10% of the parcel (Soil Survey Staff, NRCS, 2018). These soils are deep, well to moderately drained, moderate to moderately slowly permeable soils located on upland ridgetops, terraces, and hillslopes of the Southern Coastal Plain that formed in loamy fluvial and marine sediments. Principal use of these soils is for woodland and wildlife habitat.

3.8 Air Resources

3.8.1 Air Quality

The Clean Air Act of 1970, as amended, requires the establishment of National Ambient Air Quality Standards (NAAQS). Primary standards define levels of air quality that the USEPA judges to be necessary, with an adequate margin of safety, to protect the public health. Secondary standards define levels of air quality that the USEPA judges to be necessary to protect the public from any known or anticipated adverse effects of a pollutant. Both primary and secondary standards are currently in effect (Appendix G). The NAAQS pollutants are monitored in Mississippi by the Mississippi Department for Environmental Quality (MDEQ). The MDEQ has been delegated the authority for air quality protection in Mississippi. NAAQS pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb).

Prevention of Significant Deterioration (PSD) increments limit air quality degradation and ensure that areas with clean air continue to meet NAAQS, even during economic development. The PSD program goal is to maintain pristine air quality required to protect public health and welfare from air pollution effects and "to preserve, protect and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreation, scenic or historic value." PSD increment data is currently unavailable for Mississippi.

Air quality in a given region can be measured by its Air Quality Index (AQI) value. The AQI is reported according to a 500-point scale for each of the major criteria air pollutants, with the worst denominator determining the ranking. The AQI is a national index and the air quality rating is an important indicator for populations sensitive to air quality changes. The closest air monitoring station to the parcel is located in Jackson, Mississippi. On May 29, 2018, the AQI in Jackson had "Good" ratings of 28 and 20, respectively, for both particulate matter ($PM_{2.5}$) and ozone (AIRNow 2018).

3.8.2 Climate and Climate Change

3.8.2.1 Local Climate

Mississippi has a humid, sub-tropical climate characterized by typically short, mild winters following long, hot, humid summers (Department of Geosciences at Mississippi State University, 2017). Prevalent winds from the south bring warm, moist air from the Gulf, resulting in abundant rainfall during brief, intense periods followed by long periods of dry sunny weather (Department of Geosciences at Mississippi State University, 2017). The statewide annual precipitation varies between fifty (50) and sixty-five (65) inches with precipitation increasing as one moves southward. The temperate presence of the Gulf of Mexico ensures that average winter temperatures on the Gulf coast (52°F in Biloxi) are much warmer than average winter temperatures in north Mississippi (41°F in Oxford) (www.city-data.com/states/Mississippi-Climate.html). Mississippi experiences daily temperatures over 90°F for 100 days or more each year (Department of Geosciences at Mississippi State University, 2017).

3.8.2.2 Global Climate

Scientific research shows that global climate is influenced by many factors including natural processes (i.e., changes in the sun's intensity or changes in ocean circulation) and human activities (such as burning fossil fuels and increased urbanization) (Intergovernmental Panel on Climate Change [IPCC] 2013). History shows that in the past, the earth has gone through a number of ice ages with periods of warming and droughts between ages. However, the rate at which atmospheric CO_2 concentrations has risen in the past years appears to correspond with observed temperature changes.

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies 2007). In 2001, the IPCC indicated that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. The National Academy of Sciences (2008) has confirmed these findings, but also indicated that there are uncertainties regarding how changes in climate may affect different regions.

Ongoing scientific research is studying the potential effects of certain types of pollutants on global climate, particularly those that are "greenhouse gases (GHG)" (composed of carbon dioxide, CO_2; methane, CH_4; nitrous oxide, N_2O; water vapor; and several trace gasses). Through complex interactions on a regional and global scale, scientific research shows that these pollutants cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space.

Although research shows a relationship between GHG and temperature, the variety of scientific tools designed to predict changes in local or global climate limits the ability to definitively identify potential future impacts on climate. Currently, the MDEQ does not have mandatory GHG reporting requirements beyond the federal mandatory GHG reporting rule (40 CFR 98).

3.9 Water Resources - Surface/Ground Water

The Mississippi Oil & Gas Board (MOGB) regulates oil and gas operations in the state of Mississippi. The MOGB has the responsibility to gather oil and gas production data, permit new wells, establish pool rules and oil and gas allowables, issue discharge permits, enforce rules and regulations of the division, monitor underground injection wells, and ensure that abandoned wells are properly plugged and the land is responsibly restored. The MDEQ administers the major environmental protection laws and all Water Quality Act regulations pertaining to surface and groundwater (except sewage not present in a combined waste stream). According to the MDEQ, produced water if predictable in salt concentration, can be used for drilling, completion and possibly cementing.

3.9.1 Surface Water

EOI #2182a contains surface water in the form of four ponds on the proposed lease parcel. The presence of these constructed ponds provide water used in the lumber production process along with two water wells. Tishkill Creek is located ~ 1.5 miles southeast of EOI #2182a.

3.9.2 Groundwater Resources

The middle Claiborne aquifer is the primary source of groundwater in the Mississippi embayment aquifer system, where EOI #2182a is located, although portions of the aquifer are highly

mineralized (> 1,000 mg/l of dissolved solids). Wells capable of 100-300 gallons per minute water yield are typical. This aquifer, composed of fluvial sands, silts, and clays, is bounded by extensive overlying and underlying clay beds of the Jackson-Vicksburg confining unit that separate the Mississippi embayment system from the overlying coastal lowland aquifer system.

3.10 Wetlands/Riparian Areas/Floodplains

EO 11990 on the Protection of Wetlands provides an opportunity for early review of federal agency plans regarding new construction in wetland areas. Under EO 11990, each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating and licensing activities.

The nearest wetland/riparian areas are the four ponds present on the parcel. The nearest larger wetland/riparian area is Tishkill Creek, lying approximately 1.5 miles east of EOI 2182a.

3.11 Invasive/Exotic Species

There are a number of non-native species that are considered invasive in Mississippi. Mississippi's 10 Worst Invasive Weeds – a publication of the Mississippi State University Extension Service (Winters et al 2015) is summarized in Table 3-2 below. The potential applicability of these invasive species' habitat to the proposed tracts is also listed below. One of these, Chinese tallow tree, was observed during a reconnaissance site visit to EOI 2182a. While none of the remaining listed invasive species were observed on the tracts, if optimal or marginal habitat exists, it is noted in the table. Another invasive not on this list was observed, Japanese climbing fern (*Lygodium japonicum*).

Table 3-2. Mississippi's 10 Worst Invasive Weeds.

COMMON NAME	SCIENTIFIC NAME	HABITAT SUITABILITY ON PARCEL
Cogongrass	*Imperatica cylindrica*	Suitable habitat on parcel
Chinese Privet	*Ligustrum sinense*	Suitable habitat on parcel
Water Hyacinth	*Eichornia crassipes*	No suitable water on parcel
Purple Loosestrife	*Lythrum salicaria*	Suitable habitat on parcel
Alligatorweed	*Alternanthera philoxeroides*	No suitable water on parcel
Tropical Soda Apple	*Solanum viaria*	No suitable habitat on parcel
Chinese Tallow Tree	*Triadica sebifera*	Suitable habitat on parcel
Japanese Honeysuckle	*Lonicera japonica*	Suitable habitat on parcel
Johnsongrass	*Sorghum halipense*	Suitable habitat on parcel
Kudzu	*Pueraria montana*	Suitable habitat on parcel

MSU Extension Service – Publication M1194, 07-15.

3.12 Vegetation and Wildlife

3.12.1 Vegetation
EOI #2182a
EOI #2182a is a north-south oriented rectangular parcel composed of a commercial sawmill wood-storage yard bordered by a fringe of intermediate and mature forest along the north, east and southern property boundaries. The parcel is bordered on the north and east by the Bienville National Forest and on the east and south by private landowner property.

Forest vegetation consists of a mixture of younger planted pine and mature mixed pine-hardwood in the overstory including slash (*Pinus elliotti*), and loblolly (*P. taeda*) pine, white (*Quercus alba*), post (*Q. stellata*), and various red oaks, as well as sweetgum (*Liquidambar styraciflua*). A dense hardwood midstory is composed of bigleaf magnolia (*Magnolia macrophylla*), American beech (*Fagus grandifolia*), and various hickories (*Carya spp.*).

3.12.2 Wildlife
Wildlife species diversity and abundance on EOI #2182a is likely low to moderate due to the relative lack of wildlife habitat diversity and abundance including disturbance factors associated with a commercial sawmill woodyard. Species likely present in the fringe of woodland surrounding the woodyard include multiple species of forest passerines, white-tailed deer (*Odocoileus virginianus*), small rodents, and small to medium-sized omnivores and carnivores. Wildlife in or around the four ponds likely include wading birds, amphibians, insects, and reptiles.

3.13 Special Status Species

3.13.1 State Listed Species
Appendix H lists rare animal and plant species documented to occur in Smith County by the Mississippi Natural Heritage Program (MNHP) that have been given a State Rank of S1 (critically imperiled), S2 (imperiled) or S3 (rare) including the availability of suitable habitat on the parcel.

MNHP found no records for the occurrence of rare animals or plants, outstanding natural communities, natural or scenic rivers, or other elements of special concern within the proposed parcel site (MNHP email - Appendix E).

3.13.2 Federally Listed Species
Section 7 of the ESA requires that federal agencies prevent or modify any projects authorized, funded, or carried out by the agencies that are "likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat of such species." Table 3-3 lists threatened and endangered species documented by USFWS to occur in Smith County, Mississippi. The table also notes the presence of suitable habitat on the parcel. Specific information regarding habitat requirements is provided below under each species section. Details regarding species habitat, habits, threats and other information has been obtained from the Nature Serve website (www.natureserve.org) and published literature.

Table 3-3. List of threatened and endangered species documented to occur in Smith County, MS by USFWS

Species	Federal Status	Presence of Suitable Habitat
Gopher Tortoise (*Gopherus polyphemus*)	Threatened	No suitable habitat present
Red-cockaded Woodpecker (*Picoides borealis*)	Endangered	No suitable habitat present
Yellow-blotched Map Turtle (*Graptemys flavimaculata*)	Threatened	No suitable habitat present

3.13.2.1 Gopher Tortoise (*Gopherus polyphemus*) (Threatened)

Gopher tortoises are the only terrestrial tortoise east of the Mississippi River. They occur in many parts of the southeastern U.S. but currently have a threatened status only in the western part of their range (west of the Mobile and Tombigbee rivers in Alabama, Mississippi, and Louisiana); however, a status review of the eastern population for a threatened listing has been initiated (USFWS 2011). Gopher tortoises are most commonly found in upland areas characterized by a deep, well-drained, sandy substrate suitable for construction of their extensive burrows. The gopher tortoise prefers relatively open-canopied habitats that provide sunlit areas for nesting and thermoregulation, and ample herbaceous ground vegetation for forage.

Threats include increased urban development and agricultural conversion, hunting for human consumption, habitat degradation as a result of fire exclusion, habitat fragmentation, predation on eggs and young by predators, incompatible silvicultural practices (chiefly conversion to densely planted slash pine in which the dense canopy of closely packed pine trees shades the understory, preventing the growth of grasses and herbaceous plants that provide food for gopher tortoises) (NatureServe 2017). Area reduction (habitat loss and fragmentation) and habitat degradation are considered some of the greatest threats to the gopher tortoise.

No gopher tortoise or burrows were found on the proposed lease parcel during site visitation. The project parcel is located in densely vegetated loblolly and slash pine or mixed pine hardwood forest with a dense midstory and little to no understory, primarily utilized for timber production and hunting. Suitable or potential habitat for the gopher tortoise does not exist on EOI #2182a.

3.13.2.2 Red-Cockaded Woodpecker (*Picoides borealis*) (Endangered)

The red-cockaded woodpecker (RCW) is both federally and state listed as endangered. The RCW is a territorial; cooperative breeding, cavity-nesting, tree-trunk-probing insectivorous bird that is mainly associated with mature pinewoods with little or no midstory.

In general, RCW's require open pine woodlands or savannas with mature pine stems for roosting and nesting habitat. Longleaf pine ecosystems are preferred RCW nesting and roosting habitat and historically were the most extensive habitat type used throughout the species range. The USFWS has defined good roosting and nesting habitat in the *Recovery Plan for the Red-cockaded Woodpecker, Second Revision* (RCW Recovery Plan) (USFWS 2003) as mature pine forest with a rich fire-tolerant/dependent native herbaceous ground cover, clear of mid-story. Appropriate RCW habitat includes mature pine forests and mixed pine-upland hardwood forest containing little or no

hardwood mid-story. The average cavity tree ranges in age from 60 to 126 years for longleaf pine, 70 to 90 years for loblolly pine, and 75 to 149 years for shortleaf pine. RCWs forage in habitat consisting of pine stands with an average DBH of 9 inches or greater, and in pole stands with 4 to 9 inches DBH.
EOI #2182a contains a pine component of the appropriate size class for cavity trees and for foraging; however, there is a significant hardwood midstory and understory present as well as a high pine basal area. Suitable habitat for the red-cockaded woodpecker does not exist on EOI #2182a.

3.13.2.3 Yellow-Blotched Map Turtle (*Graptemys flavimaculata*) (Threatened)
The yellow-blotched map turtle is confined to the Pascagoula River system, including the Leaf, Chickasawhay, and Escatawpa rivers, in southern Mississippi (USFWS 1993). The Leaf and Chickasawhay Rivers merge to form the Pascagoula; the Escatawpa is a tributary which joins the lower Pascagoula just before its estuary. The yellow-blotched map turtle is exclusively riverine and inhabits mainly sunny river sections with a moderate to strong current, abundant sand bars, and abundant deadwood basking sites. The yellow-blotched map turtle feeds primarily on snails and insects.

The yellow-blotched map turtle was listed as federally threatened under the ESA in 1991, as endangered by the State of Mississippi, and was included in CITES Appendix III (United States) on 14 June 2006 (van Dijk, 2011). The proposed lease parcel is not located on the Pascagoula River system nor does it contain any river or river tributary. The proposed lease parcel in Smith County offers no suitable feeding, nesting, sunning, or basking habitat for the yellow-blotched map turtle. Suitable habitat for the yellow-blotched map turtle does not exist on EOI #2182a.

3.14 Migratory Bird Species of Concern
The Migratory Bird Treaty Act of 1918 (MBTA), as amended, makes it unlawful to"pursue, hunt, take, capture, kill, attempt to take, capture or kill, or possess any migratory bird or any part, nest, or egg of any such bird", unless expressly permitted by Federal regulations (16 U.S.C. 703(a)). Executive Order (EO) 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, directs Federal agencies to integrate conservation principles, measures, and practices into authorized activities and avoid or minimize, to the extent practicable, adverse impacts on migratory bird resources. The Service and the BLM signed a memorandum of understanding (MOU) in 2010, to promote the conservation and strategic management of migratory birds on BLM managed public lands and Federal mineral split estate lands. Measures to comply with the MBTA shall be applied to ensure protection for migratory birds and encourage conservation actions in oil and gas development activities that might otherwise adversely impact habitats.

Because of the many species that fall within one or more of these groups, BLM focuses on species identified by USFWS as Birds of Conservation Concern (BCC) (USFWS 2008). Appendix I lists the BCC found in the Southeastern Coastal Plain where EOI #2182a is located. There is little suitable habitat on the proposed lease parcel for most BCC on this list.

4.0 CHAPTER 4 - ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION
This chapter assesses the anticipated environmental consequences associated with direct, indirect, and cumulative effects of the Proposed Action and No Action Alternative. In accordance with DOI

and BLM NEPA procedures, the level of detail, scope, and complexity of analyses should be commensurate with the scale, impacts, scientific complexities, uncertainties, and other aspects (such as public concern), inherent in potential decisions. Therefore, the level of analysis presented in this EA for each resource is based on factors such as the size of the project and anticipated level of effect. The Proposed Action of leasing the parcel would, by itself, have no direct impact on any resources in the lease area since there would be no surface disturbing activities. All anticipated resource impacts would be associated with potential future oil and gas development. For the purpose of this EA, a RFD scenario is used to assess the potential impacts from reasonably foreseeable, but yet uncertain, future oil and gas development as a result of leasing the parcel. If development results from the proposed lease, short-term impacts from potential development are considered those that would be stabilized or mitigated within five years and long-term impacts are those that would substantially remain for more than five years. Cumulative impacts include the combined effect of past projects, specific planned projects and other reasonably foreseeable future actions such as other infield wells being located within the nearby area. Cumulative impacts are addressed at the end of this Chapter.

4.1 Land Use

There would be no direct impacts to land use as a result of leasing as there would be no surface disturbing activities at this stage. The RFD scenario developed for this EA predicts that approximately 8.61 acres of surface disturbance would occur within the larger, state-determined drilling and production unit area in the future. There would likely be short and long-term changes to land use as a result of reasonably foreseeable oil and gas development on this land. Reclamation activities at the site would result in some of the land being reverted to natural conditions over time.

4.2 Noise Resources

Area residents are accustomed to the industrial noise generated by normal sawmill operations and vehicles entering and leaving the sawmill. While the act of leasing federal minerals would produce no impacts to noise since there is no surface disturbing activities at this time, subsequent exploration/development within the the state-determined drilling and production unit containing EOI #2182a could affect noise levels on adjacent lands but would reasonably be expected to decrease over time.

Noise generation from well operations would be associated with vehicle movements and the operation of production equipment. There could be short-term noise impacts associated with construction, drilling, and/or completion of reasonably foreseeable oil and gas development activities but the intensity of the impacts would likely be minimal. Noise generating activities would lessen over time as production commences, when the site would be visited periodically and/or to haul produced fluids. Short-term impacts from noise on people and wildlife species inhabiting the area during drilling are expected to be minimal and of short duration with no long-term impacts beyond what is currently located on the site.

4.3 Socioeconomics

The direct effect of the Proposed Action would be the payments received, if any, from the leasing of 79.70 acres of federal mineral estate. If the lease is sold and it leads to actual well drilling and economic production in the future, it would likely bring modest revenues in the form of royalty payments, severance taxes, and rent monies to the state and county. Economic production would

provide wages and salaries to employees, maintenance staff, and contractors employed in drilling wells, and sales to area hotels, restaurants, and other businesses that serve drillers for the duration of drilling and similar construction-related benefits later as wells are abandoned and sites restored.

It is speculative to predict the exact effects of this action since there is no guarantee that the lease will receive bids, and that the parcel will be developed and produce fluid minerals. At this time, it is not possible to determine the magnitude and duration of potential impacts either in terms of payments received or changes in employment patterns in Smith County, but any effects would be anticipated to be beneficial.

4.4 Cultural Resources and Native American Concerns

There would be no direct impacts to cultural resources or Native American interests as a result of leasing as there would be no surface disturbance at this stage. Cultural resource surveys have not been conducted on EOI #2182a and therefore there may be undiscovered cultural resources present on or around the parcel. Literature reviews from the state historic preservation office indicate this lease parcel does not have recorded historic or cultural resources but may have sites within one mile. If sites are located and recorded before ground disturbance begins, these impacts can be avoided or mitigated (see Section 4.4.3).

Consultation with the SHPO and coordination with the tribes occurred on February 22, 2018 (Appendix E). A concurrence letter was received from SHPO on March 19, 2018 (Appendix E). A response was received from one tribe on March 23, 2018 agreeing that cultural resource studies are warranted prior to approval of any development proposals.

4.4.1 Possible Future Best Management Practices, Standard Operating Procedures and/or Mitigation Measures

A BLM stipulation regarding cultural resources and Native American religious concerns applies to the lease parcel (Appendix D). The stipulation states that the BLM would not approve any ground disturbing activities that may affect historic properties and/or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. If currently unknown burials are discovered during development activities associated with this lease, these activities must cease immediately, applicable law on unknown burials will be followed and, if necessary, consultation with the appropriate Tribe/group of federally recognized Native Americans would take place.

4.5 Minerals and Mineral Development

There would be no direct impacts to minerals from the Proposed Action, since there would be no surface disturbing activities at this stage; however, subsequent exploration and oil and gas development could impact the production horizons and reservoir pressures. If production wells are established, the resources allotted to the wells would eventually be depleted. There could also be impacts to other mineral resources as a result of exploration/development through the loss of available surface or subsurface area needed to develop or access the other mineral resource overlapping the subject lease parcel. The extent of the impacts to mineral resources, if any, would be further determined once site-specific development information is available at the APD stage.

4.6 Wastes

There would be no direct impacts due to waste generation from the Proposed Action, since there would be no surface disturbing activities at this stage; however, subsequent exploration/oil and gas development could result in the introduction of hazardous and non-hazardous substances to the area. Oil and gas development activities typically generate the following wastes: (1) discharge of drilling fluids and cuttings into the reserve pits, (2) wastes generated from used lubrication oils, hydraulic fluids, and other fluids used during production of oil and gas, some of which may be characteristic or listed hazardous waste, and (3) service company wastes from exploration and production activities as well as containment of some general trash. The drilling fluids, drill cuttings, and produced waters are classified as a RCRA exempt waste, and potential drilling that could occur would not introduce hazardous substances into the environment if they are managed and disposed of properly under federal, state, and local waste management regulations and guidelines. Properly used, stored, and disposed of hazardous and non-hazardous substances greatly decreases the potential for any impact on any environmental resources. One way operators and the BLM ensure hazardous and non-hazardous substances are properly managed is through the preparation of a Spill Prevention, Control, and Countermeasure (SPCC) plan.

4.7 Soils

While the act of leasing federal minerals would not affect soils, subsequent exploration/development may produce short and long-term impacts by physically disturbing the topsoil and exposing the substratum soil on subsequent project areas. Direct impacts from reasonably foreseeable oil and gas construction of well pads, access roads, and reserve pits include: removal of vegetation, exposure of the soil, mixing of horizons, compaction, loss of topsoil productivity and susceptibility to wind and water erosion. These impacts could result in increased indirect impacts such as runoff, erosion and off-site sedimentation. Activities that could cause these types of indirect impacts include construction and operation on well sites, access roads, gas pipelines and facilities.

Contamination of soil from future drilling, and production wastes mixed into soil or spilled on the soil surface could cause a long-term reduction in site productivity. Contaminants spilled on soil have the potential to pollute and/or change the soil chemistry (see also Section 4.6, Wastes). A standard BLM COA would apply at the APD stage, should federal minerals be accessed, which would require the operator to take necessary precautionary and preventive measures to avoid soil erosion and contamination.

4.8 Air Resources

4.8.1 Air Quality

The administrative act of offering the proposed lease parcel would have no direct impacts on air quality. Any potential effects to air quality would occur if and when the lease were developed. Any proposed development project would be subject to additional analysis of possible air effects before approval and the analysis may include air quality modeling. A Memorandum of Understanding between the Departments of the Interior and Agriculture and USEPA directs that air quality modeling be conducted for actions that meet certain emissions or geographic criteria:

- Creation of a substantial increase in emissions

- Material contribution to potential adverse cumulative air quality impacts
- Class I or sensitive Class II Areas
- Non-attainment or maintenance area
- Area expected to exceed NAAQS or PSD increment

The project area includes no Class I, sensitive Class II, or non-attainment areas. Due to the small number of wells (one) projected to follow a lease on the lease tract in relation to the current volume of hydrocarbon, development of the lease is not likely to exceed the emissions criteria, NAAQS or PSD increment and therefore would likely not require modeling.

4.8.1.1 Possible Future Best Management Practices, Standard Operating Procedures and/or Mitigation Measures

The BLM encourages industry to incorporate and implement BMPs, which are designed to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. Typical measures include:

- Flared hydrocarbon gases at high temperatures in order to reduce emissions of incomplete combustion
- Watering dirt roads during periods of high use to reduce fugitive dust emissions
- Co-location wells and production facilities to reduce new surface disturbance
- Implementation of directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores
- Requiring that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored
- Performing interim reclamation to reclaim areas of the pad not required for production facilities and to reduce the amount of dust from the pads

Additionally, the BLM encourages oil and natural gas companies to adopt proven, cost-effective technologies and practices that improve operational efficiency and reduce natural gas emissions.

4.8.2 GHGs and Climate

The administrative act of leasing the proposed federal minerals would not result in any direct GHG emissions; however, potential future development of the proposed lease may contribute to the installation and production of new wells, which may consequently lead to an increase in GHG emissions.

The assessment of GHG emissions, their relationship to global climatic patterns, and the resulting impacts is an ongoing scientific process. The inconsistency in results of scientific models designed to predict changes in climate on regional or local scales, limits the ability to assess the significance of any discrete amount of GHG emissions on global climate. When further information is available, such information would be incorporated in the BLM's planning and NEPA documents as appropriate.

4.9 Water Resources - Surface/Ground Water

While the act of leasing federal minerals would produce no impacts to water resources, subsequent exploration and development of the lease parcel has the potential to produce impacts. The physical

effects of mineral extraction include erosion, compaction, sedimentation, and potential groundwater contamination. Sedimentation and pollution of streams or wetlands can occur down-gradient from such activity sites (USDA 2010). Surface disturbance from the construction of well pads, access roads, pipelines, and utility corridors can result in degradation of surface water and groundwater quality from non-point source pollution, increased soil losses, and increased erosion.

4.9.1 Surface Water Resources

Potential impacts to surface water that may occur from construction of well pads, access roads, fracturing ponds, pipelines, utility lines and production include:

- Increased surface runoff and off-site sedimentation brought about by soil disturbance
- Increased salt loading and water quality impairment of surface waters
- Channel morphology changes due to road and pipeline crossings and possible contamination of surface waters by spills

The magnitude of these impacts to water resources would depend on the proximity of the disturbance to the drainage channel, slope aspect and gradient, degree and area of soil disturbance, amount of local precipitation, soil character, and duration and time before implementation mitigation or clean up measures can be put into place.

Minor long-term direct and indirect impacts to the watershed could occur from water discharge from roads, road ditches, and well pads, but would decrease once all well pads and road surfacing material has been removed and reclamation of well pads, access roads, pipelines, and powerlines have taken place. Interim reclamation of the portion of the well pad not needed for production operation, re-vegetating the portion of the pad needed for production operations, and re-vegetating road ditches would reduce this long-term impact. Short-term direct and indirect impacts to the watershed from future access roads that are not surfaced with impervious materials would occur and would likely decrease in time due to reclamation efforts.

4.9.1.1 Possible Future Best Management Practices, Standard Operating Procedures and/or Mitigation Measures

The BLM will closely analyze areas proposed for drilling in APDs during the onsite inspection, since regional wetland inventories often do not capture small wetlands. USEPA requires that Storm Water Pollution Prevention Plans and SPCCP be in place to prevent any spill from reaching surface water due to rain events or accidental release of fluids related to production operations.

A BLM freshwater aquatic habitat stipulation is attached to EOI #2182a in the proposed lease (Appendix D). The stipulation states that to protect the water quality of watersheds and natural stream substrate and morphology and to avoid potential impacts to aquatic species and their habitat, no surface occupancy or disturbance, including discharges, are permitted within 250 feet of a river, stream, wetland spring, headwater, wet meadow, wet pine savanna, pond, tributary, lake, coastal slough, sand bar, vernal pools, calcareous seepage marsh, or small, marshy calcareous stream. If the slope exceeds 10 percent, the buffer may be extended to 600 feet to provide adequate protection for aquatic habitats and associated resources.

Regardless of buffer width, appropriate sediment and erosion control BMPs should be implemented as defined in the following documents: (1) Mississippi Forestry Best Management Practices (2008) and (2) Implementations of Forestry Best Management Practices (2012). These BMP documents can be found at http://www.southernforests.org/water/SGSF%20BMP%20Report%202012.pdf.

4.9.2 Ground Water Resources

Groundwater can be affected by multiple factors, including industrial, domestic, or agricultural activities through withdrawal, injection (including chemical injection), or mixing of materials from different geologic layers or the surface. Withdrawal of groundwater could affect local groundwater flow patterns and create changes in the quality or quantity of the remaining groundwater. Impacts to the quality of groundwater from future development, should they occur, would likely be limited to near a well bore location due to inferred groundwater flow conditions in the area of the parcel.

Contamination of groundwater could occur without adequate cementing and casing of a well bore. Failure of the cement or casing surrounding the wellbore is a possible risk to water supplies. Complying with BLM and state regulations regarding casing and cementing, implementing BMPs, testing casings and cement prior to continuing to drill or introducing additional fluids and continual monitoring during drilling, allow producers and regulators to check the integrity of casing and cement jobs and greatly reduce the chance of aquifer contamination.

Petroleum products and other chemicals used in the drilling and/or completion process could result in groundwater contamination through a variety of operational sources including but not limited to pipeline and well casing failure, well (gas and water) construction, and spills. Similarly, improper construction and management of reserve and evaporation pits could degrade ground water quality through leakage and leaching.

The potential for negative impacts to groundwater caused from completion activities have not been confirmed but are not likely. Authorization of the proposed project would require full compliance with local, state, and federal directives and stipulations that relate to surface and groundwater protection and the BLM would deny any APD who proposed drilling and/or completion process was deemed to not be protective of usable water zones as required by 43 CFR 3162.5-2(d).
Typically when groundwater is used as a source of drilling/completion water, impacts to the aquifer would be minimal due to the size of the aquifers impacted and recharge potential across the entire aquifer. The time it takes depends greatly on rainfall events, surface soil materials, drought conditions, and frequency of pumping that has already occurred and will continue to occur into the future. The amount of water actually used for drilling/completion activities is highly dependent on a number of factors including: length of well bore, closed-loop or reserve pit drilling system, type of mud, whether hydraulic fracturing would be used during stimulation, whether recycled water would be used, dust abatement needs, and type and extent of construction, to name a few. The impacts of water use on water quality and quantity would be analyzed in more detail during the APD review.

Any proposed drilling/completion activities would need to comply with Onshore Order #2, 43 CFR 3160 regulations, and not result in a violation of a federal and/or state law. If these conditions were not met, the proposal would be denied.

4.9.2.1 Possible Future Best Management Practices, Standard Operating Procedures and/or Mitigation Measures

The BLM recommends that fluid impermeable containment systems (i.e. liners, dikes, berms) be placed in, under and/or around any tank, pit, drilling cellar, ditches associated with the drilling process, or other equipment that use or has the potential to leak/spill hazardous and non-hazardous fluids, to prevent chemicals from penetrating the soil and impacting the aquifer or from moving off-site to a surface water source.

Complying with BLM and state regulations regarding casing and cementing, implementing BMPs, testing casings and cement prior to continuing to drill or introducing additional fluids and continual monitoring during drilling, allow producers and regulators to check the integrity of casing and cement jobs and greatly reduce the chance of aquifer contamination. Cumulative effects to ground water are not anticipated if SOPs, BMPs, and SUCOAs as described in this EA are implemented.

4.10 Wetlands/Riparian Areas/Floodplains

While the act of leasing federal minerals would produce no direct impacts to wetland/riparian areas/floodplains, this area could be adversely impacted by subsequent mineral development (drilling, production, et.) by changing the water quality or quantity (chemical spills, storm water runoff, etc.). Potential effects and BMPs outlined to avoid effects to these areas are the same as those described in Section 4.9.1, Surface Water.

4.11 Invasive/Exotic Species

While the act of leasing federal minerals would not contribute to the spread or control of invasive or non-native species, subsequent exploration/development may. Any surface disturbance could establish new populations of invasive non-native species, although the probability of this happening cannot be predicted using existing information. Noxious weed seeds can be carried to and from the project areas by construction equipment, the drilling rig and transport vehicles. At the APD stage, BLM requirements for use of weed control strategies would minimize the potential for the spread of these species.

4.11.1 Possible Future Best Management Practices, Standard Operating Procedures and/or Mitigation Measures

BMPs require that all federal actions involving surface disturbance or reclamation take reasonable steps to prevent the introduction or spread of noxious weeds, including requirements to use weed-free hay, mulch and straw. A BLM COA as well as a Lease Notice (Appendix D) applies to all APDs, should federal minerals be accessed, which recommends that native cover plants in seeding mixtures be used during reclamation activities. Post-construction monitoring for cogon grass and other invasive plant species should be conducted to ensure early detection and control. If invasive species are found, the proper control techniques should be used to either eradicate the species from the area or minimize its spread to other areas. If cogon grass is found on site, equipment should be washed before exiting the site to prevent the spread of this highly invasive species to other locations.

4.12 Vegetation and Wildlife

There would be no direct impacts to vegetation and wildlife from leasing, since there is no surface disturbance at this stage; however, reasonably foreseeable oil and gas development could result in short and long term impacts to vegetation and wildlife on EOI #2182a.

Short-term impacts to vegetation from future development would primarily result from removal of vegetation for construction of well pads and associated infrastructure. Long-term vegetation loss could include those portions of the well pad needed for production operations for the life of the well and access road.

Impacts to wildlife could result from increased habitat fragmentation, noise, or other disturbance during development. Although reclamation and restoration efforts for surface disturbance could provide for the integrity of other resources, these efforts may not always provide the same habitat values (e.g. structure, composition, cover, etc.). Short-term negative impacts to wildlife would occur during the construction and production phase of the operation (drilling, fracturing, production, etc.) due to noise and habitat destruction. In general, most wildlife species would become habituated to the new facilities. For other wildlife species with a low tolerance to activities, the operations on the well pad would continue to displace wildlife from the area due to ongoing disturbances such as vehicle traffic, noise and equipment maintenance.

Many common species expected to occur on the lease parcel have broad habitat requirements and would continue to be found in a variety of habitats in the surrounding areas. Wildlife use of the site after the well is put into production would vary depending on vegetation and succession stage. Once put into production, the well pad would be reduced in size and the reserve pit would be graded and seeded. The producing well site would be subject to regular maintenance and inspection. Wildlife use of the site is dependent on the adequacy of restoration. However, over the life of the well, some of the acreage would be excluded from utilization by most wildlife species.

4.12.1 Possible Future Best Management Practices, Standard Operating Procedures and/or Mitigation Measures

Measures would be taken to prevent, minimize, or mitigate impacts to fish and wildlife animal species from exploration and development activities. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. Mitigation could potentially include rapid re-vegetation, noise restrictions, project relocation, or pre-disturbance wildlife species surveying.

A standard BLM COA and Lease Notice for Perching and Nesting Birds and Bats (Appendix D) would apply at the APD stage that is designed to prevent bat and bird mortality, should federal minerals be accessed. The COA states that all open vent stack equipment, such as heater-treaters, separators, and dehydrator units, will be designed and constructed to prevent birds and bats from entering or nesting in or on such units, and to the extent practical, to discourage birds from perching on the stacks. Installing cone-shaped mesh covers on all open vents is one suggested method. Flat mesh covers are not expected to discourage perching and will not be acceptable.

4.13 Special Status Species

There would be no direct impacts to special status species from leasing, since there is no surface disturbance at this stage; however, reasonably foreseeable oil and gas development could result in short and long-term impacts to federally listed species within the larger, state-determined drilling and production unit area containing EOI #2182a, if present. Table 4-1 list BLM effect determinations for these species and rationale for those determinations.

Table 4-1. BLM effect determinations for species documented by USFWS to occur in Smith County, Mississippi.

Species	Federal Status	Determination	Rationale
Gopher Tortoise (*Gopherus polyphemus*)	Threatened	No effect	No suitable habitat present
Red-cockaded Woodpecker (*Picoides borealis*)	Endangered	No effect	No suitable habitat present
Yellow-blotched Map Turtle (*Graptemys flavimaculata*)	Threatened	No effect	No suitable habitat present

On EOI #2182a in Smith County, Mississippi, there is no suitable habitat for the gopher tortoise, red-cockaded woodpecker, or the yellow-blotched map turtle. BLM has determined that reasonably foreseeable oil and gas development would have no effect on these species due to a lack of suitable habitat.

4.13.1 Informal Consultation

BLM has determined that the proposed project will have no effect on the gopher tortoise, red-cockaded woodpecker, or the yellow-blotched map turtle on EOI #2182a located in Smith County, due to a lack of suitable habitat on the proposed project site.

Informal consultation with USFWS, Mississippi Ecological Services Office (MESO) was initiated on June 7, 2018. A signed letter of concurrence with BLM determinations was received on June 27, 2018 and is located in Appendix E. There is no statutory requirement for USFWS to concur with a "no effect" determination so the MESO provided no additional comments or concerns regarding the gopher tortoise, red-cockaded woodpecker, and yellow-blotched map turtle on EOI #2182a located in Smith County.

4.14 Migratory Bird Species of Concern

While the act of leasing would not affect migratory birds, subsequent exploration/development of the subject parcel may produce impacts. Surface disturbance from the development of well pad, access roads, pipelines, and utility lines can result in an impact to migratory birds and their habitat.

4.14.1 Possible Future Best Management Practices, Standard Operating Procedures and/or Mitigation Measures

Per the Memorandum of Understanding between BLM and USFWS, entitled, "To Promote the Conservation of Migratory Birds," the following temporal and spatial conservation measures must be implemented as part of the COAs with an APD:

1. Avoid any take of migratory birds and/or minimize the loss, destruction, or degradation of migratory bird habitat while completing the proposed project or action.

2. If the proposed project or action includes a reasonable likelihood that take of migratory birds will occur, then complete actions that could take migratory birds outside of their nesting season. This includes clearing or cutting of vegetation, grubbing, etc. The primary nesting season for migratory birds varies greatly between species and geographic location, but generally extends from early April to mid-July. However, the maximum time period for the migratory bird nesting season can extend from early February through late August. Strive to complete all disruptive activities outside the peak of migratory bird nesting season to the greatest extent possible.

3. If no migratory birds are found nesting in the proposed project or action areas immediately prior to the time when construction and associated activities are to occur, then the project activity may proceed as planned.

To protect perch and roosting sites and terrestrial habitats for and to avoid potential impacts to migratory birds, the following standard BLM COAs would apply at the APD stage, should federal minerals be accessed:

- Any reserve pit that is not closed within 10 days after a well is completed and that contains water must be netted or covered with floating balls, or another method must be used to exclude migratory birds

- All power lines must be built to protect raptors and other migratory birds, including bald eagles, from accidental electrocution, using methods detailed by the Avian Power Line Interaction Committee (APLIC)

4.15 No Action Alternative for All Resources

Under the No Action Alternative, the proposed lease parcel would not be made available for lease. There would be no subsequent impacts from oil and/or gas construction, drilling, and production activities. The No Action Alternative would result in the continuation of the current land and resource uses in the proposed lease area for all resources except for Cultural and Native American Concerns to which the following would be added:

If the proposed lease is not made available and cultural resource surveys are not conducted, direct and indirect impacts may occur. Direct impacts are those such as completely destroying a site by "relic hunters" or by people picking up artifacts. Other direct impacts may be the mixing of layers in a site by plowing or the destruction of a site by land leveling. Indirect impacts are those such as after timber thinning or clear-cutting resulting in erosion of a site.

4.16 Cumulative Effects

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from 'the incremental impacts of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Recent CEQ guidance in considering cumulative effects involves defining the scope of the other actions and their interrelationship with the

Proposed Action. The scope must consider geographical and temporal overlaps among the Proposed Actions and other actions. It must also evaluate the nature of interactions among these actions.

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the affected area includes the proposed lease area and surrounding vicinity.

4.16.1 Context for Cumulative Effects Analysis

Offering the subject parcel for lease, and the subsequent issuance of the lease, in and of itself, would not result in any cumulative impacts; however, the Proposed Action does include an analysis of the potential reasonably foreseeable oil and gas development that could occur in the future associated with the lease parcel, which serves as the basis for assessing whether there could be any cumulative effects associated with the possible future development of the lease parcel. The 79.70 acres of federal mineral estate could potentially add 1 or more vertical wells from 1 well pad if the parcel is leased and developed.

4.16.2 Cumulative Effects Analysis

The area surrounding EOI #2182a in Smith County has been lightly drilled for natural gas well development activity (< 10 wells per township) during the last 20 years; however, future activity is expected to increase due to recent area interest.

The incremental effect of the Proposed Action and No Action Alternative in combination with other past, present, or reasonably foreseeable actions on resources including land use, visual/noise resources, vegetation and wildlife (including invasives and migratory birds), soil resources, cultural resources, water resources, soils, and wastes is relatively minor. Further NEPA analysis at the APD stage will address cumulative impacts of any proposed development at the site-specific level; however, this EA does discuss cumulative impacts from leasing on a general level. Following is a discussion of potential cumulative effects associated with the Proposed Action and No Action Alternative.

Land Use

There would be no cumulative impacts to land use as a result of leasing EOI #2182a; however, the RFD scenario projects approximately 8.61 acres of surface disturbance associated with reasonably foreseeable development from potential future oil and gas activities. The area surrounding EOI #2182a is largely rural with minimal development. Other activities occurring in the area include logging and some agriculture, which over time may contribute to changes in existing land uses if these activities are changed or expanded. Potential future development associated with the leasing of EOI #2182a would contribute minimally to land use conversion in the area and is consistent with ongoing uses of the land in the general vicinity of the proposed lease parcel. Therefore, there would be no perceptible cumulative impacts to land use from implementing the Proposed Action and No Action Alternative.

Noise Resources

There would be no cumulative impacts to noise resources as a result of leasing EOI #2182a in Smith County, Mississippi. The RFD scenario projects approximately 8.61 acres of surface

disturbance associated with reasonably foreseeable development from potential future oil and gas activities. Because the area surrounding EOI #2182a in Smith County is largely rural with minimal development, there are few noise-generating activities in the area above and beyond those typical of a rural, forested and agricultural area. Forestry and agriculture activities typically do not produce noise levels that would result in noise ordinance violations. A commercial sawmill presently located adjacent to EOI #2182a produces significant area noise levels. Potential well development would not cause an appreciable increase in area noise levels. Because the other activities in the area are spatially temporally separated, the Proposed Action and No Action Alternative would not result in a cumulative impact to the noise or visual environment.

Cultural Resources and Native American Concerns

There would be no cumulative impacts to cultural resources as a result of leasing EOI #2182a; however, potential cumulative effects to cultural resources could occur if future development activities on or near the parcel are conducted without proper surveys and consultations under the NHPA or state requirements. Cumulative effects from repetitious illegal activity, primarily archeological vandalism, may occur on certain sites or site types unless perpetrators are apprehended and prosecuted. The degree of cumulative effects to known properties from BLM activities, however, should be slight as inventory, assessment, protection, and mitigation measures would be implemented at the APD stage if federal minerals are accessed. Under the No Action Alternative, operators in the vicinity would be required to comply with all required laws and regulations with regard to protection of cultural resources and Native American Concerns.

Socioeconomics

Cumulative effects to socioeconomics from reasonably foreseeable future development would likely be positive, but minor. At this time, it is not possible to determine with certainty the magnitude and duration of potential impacts either in terms of payments received or changes in employment patterns in Smith County. Additional analysis will be conducted at the APD stage where socioeconomic impacts will be further assessed. Many of the cumulative socioeconomic effects and impacts associated with oil and gas development are already occurring in the region and would be perpetuated in the future. For instance, oil and gas activity is generating employment opportunities and labor earnings for communities that support these types of activities.

The Proposed Action and No Action Alternative would not disproportionately affect low income or minority populations; therefore, there would be no cumulative effects to these groups.

Soils

Increases in mineral development, construction activities, and the conversion of land to developed landscapes collectively result in the removal of vegetation, long-term reduction in vegetation cover, and disturbance of soils. This would expose soils to the erosive forces of wind and water, destabilize soils, and increase overland flow, which in turn could result in accelerated erosion. Accelerated erosion could mobilize soils and remove nutrient-rich topsoil, and thereby reduce soil productivity and vegetation growth rates. The incremental effect of the Proposed Action and No Action Alternative with other activities on soils in the vicinity would be small. Cumulative impacts to soil resources would therefore be negligible.

Mineral Resources

There would be no cumulative impacts to minerals from the administrative action of leasing the EOI #2182a, but the potential reasonably foreseeable development projected under the RFD scenario in combination with other mineral development activities in the area would result in a minor incremental effect from development on BLM federal mineral estate. At this stage it is uncertain how productive the well accessing the federal mineral estate would be, should development occur in the future. If developed, the mineral resources would be drained and depleted over time.

Wastes

As noted in the Proposed Action description, impacts from waste storage, handling, and disposal would be minimized through the use of BMPs, SOPs, and COAs at the APD stage, should federal minerals be proposed for development. Other mineral development, agriculture, and timber management activities in the area would need to comply with all required laws and regulations with regard to wastes. Therefore, cumulative effects from wastes are not anticipated.

Natural Resources (Vegetation and Wildlife, Special Status Species, Invasive Species, Migratory Birds)

The Proposed Action and No Action Alternative would contribute a minor amount of potential vegetation loss from reasonably foreseeable development. Under the RFD scenario, approximately 8.61 acres of surface disturbance could occur from future oil and gas activities associated with EOI #2182a. The loss of vegetation would also affect wildlife using that habitat, although many species would likely relocate during construction from future development activities. Reclamation activities would help restore vegetation conditions. Future site-specific analysis would be conducted at the APD stage. Cumulative effects to vegetation, wildlife, special status species, and migratory birds would be minor and cumulative effects to the population level of species are not expected. The Proposed Action would not be expected to significantly compound current patterns of habitat fragmentation, degradation, or wildlife patterns. If BLM weed control strategies are implemented, cumulative effects due to invasive species are not anticipated.

Water Resources (Surface and Ground Water, Floodplains, Riparian Areas, and Wetlands)

There would be no cumulative impacts to water resources from the administrative action of leasing EOI #2182a, however, energy and mineral development, construction activities, forestry, agriculture, and the conversion of land to developed landscapes, collectively results in the removal of vegetation, long-term reduction in overall vegetation cover, and disturbance of soils. This would increase overland flow, result in accelerated soil erosion, and decrease the ability of watersheds to buffer high flows and filter water, sediment, and nutrients. Soil mobilized by wind and water erosion would be transported downslope and to nearby water bodies, which would increase sediment and nutrient loads to streams, rivers, lakes, and reservoirs and thereby degrade water quality. Increases in overland flow also would directly increase the amount of water transported to streams and rivers, which could lead to increased downcutting, widening, and overall degradation of stream channels. The incremental effect of the Proposed Action and No Action Alternative would result in negligible cumulative effects to surface water.

Air Quality

Cumulative effects from potential oil and gas development from the proposed lease and possible future development could be an overall increase in CO, NOx, SO_2, Pb, PM, CO_2, CH_4, and N_2O.

However, according to USEPA's Air Trends report for 2011 (USEPA 2011), since 1990, nationwide air quality has improved significantly for the six common air pollutants. These six pollutants are ground-level O_3, $PM_{2.5}$, PM_{10}, Pb, NO_2, CO, and SO_2. Nationally, air pollution was lower in 2010 than in 1990 for:

- 8-hour O_3, by 17%
- 24-hour PM_{10} , by 38%
- 3-month average Pb, by 83%
- annual NO_2 , by 45%
- 8-hour CO, by 73%
- annual SO_2 , by 75%

Climate Change

The administrative action of leasing would not result in any GHG emissions; however, potential future development would likely result in GHG emissions. The Proposed Action would not result in a violation of any NAAQ or criteria pollutant in the area of the proposed lease. The incremental contribution to global GHGs from the Proposed Action cannot be translated into effects on climate globally or locally, due to the uncertainties associated with ongoing scientific research. When further information on the impact to climate is known, such information would be incorporated in the BLM's planning and NEPA documents as appropriate.

4.17 Irreversible and Irretrievable Commitments of Resources

NEPA Section 102(2)C requires a discussion of any irreversible or irretrievable commitments of resources that would be involved in the proposal should it be implemented. An irreversible commitment of a resource is one that cannot be reversed (e.g., the extinction of a species or disturbance to protected cultural resources). An irretrievable commitment of a resource is one in which the resource or its use is lost for a period of time (e.g., extraction of any solid mineral ore or fluid mineral).

Reasonably foreseeable oil and gas development associated with the Proposed Action would result in a minor amount of surface disturbing activities that would result in irreversible or irretrievable commitments of resources. These surface disturbing activities would result in alterations to soil, removal of vegetation cover and wildlife habitat, and possible damage to cultural resources if proper surveys and consultations are not conducted under the NHPA. Increases in sediment and nonpoint source pollution that result from these activities could result in degradation of water quality within the watershed and habitat for aquatic-dependent species, although no major surface waters are located adjacent to the parcel. Use of BMPs, SOPs, COAs and stipulations as described in the EA are designed to reduce the magnitude of these impacts by preventing habitat degradation. Development of oil and gas wells would represent an irretrievable commitment of nonrenewable fossil fuels.

4.18 Relationship between Local Short-term Uses and Long-term Productivity

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and of the effects that these impacts may have on the maintenance and enhancement

of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development option reduces future flexibility in pursuing other options, or that giving over a parcel of land or other resource to a certain use eliminates the possibility of other uses being performed at the site.

The Proposed Action would take place within a relatively rural area with minimal development. No unique habitat or ecosystems would be lost due to this action. Implementation of the Proposed Action or No Action Alternative may result in future oil and gas development, which results in surface disturbing and other disruptive activities that remove vegetation, increase soil erosion and compaction, create visual intrusions and landscape alterations, increase noise, and degrade wildlife habitat. Although management actions, BMPs, surface use restrictions, and lease stipulations are intended to minimize the effect of short-term uses, some impact on long-term productivity of resources would occur; however, the level of impact would be minor.

5.0 CHAPTER 5 – LIST OF PREPARERS

Key Personnel included:

Jason Ross, Planning and Environmental Specialist, BLM Eastern States, Southeastern States District Office

Alison McCartney, Wildlife Biologist, BLM Eastern States, Southeastern States District Office

James Schoolar, GIS Specialist, BLM Eastern States, Southeastern States District Office

John Sullivan, Archeologist, BLM Eastern States, Southeastern States District Office

Bill Bagnall, Petroleum Geologist, BLM Eastern States, Southeastern States District Office

6.0 CHAPTER 5 – REFERENCES

BLM NEPA Handbook

BLM WO IM 2010-117

Chapman, S.S., Griffith, G.E., Omernik, J.M., Comstock, J.A., Beiser, M.C., and Johnson, D., 2004. Ecoregions of Mississippi, (color poster with maps, descriptive text, summarizing tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,000,000).

Council on Environmental Quality (CEQ). 1997. *Environmental Justice: Guidance under the National Environmental Policy Act.* Retrieved from https://www.energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-EJGuidance.pdf

Exec. Order No. 11988, 3 C.F.R. (1977). Print.

Exec. Order No. 11990, 3 C.F.R. (1977). Print.

Exec. Order No. 12898, 3 C.F.R. (1994). Print.

Exec. Order No. 13007, 3 C.F.R. (1996). Print.

Exec. Order No. 13084, 3 C.F.R. (1998). Print.

Exec. Order No. 13175, 3 C.F.R. (2000). Print.

Exec. Order No. 13186, 3 C.F.R. (2001). Print.

Exec. Order No. 13188, 3 C.F.R. (2001). Print.

Goddard Institute for Space Studies. 2007. Annual Mean Temperature Change for Three Latitude Bands. Datasets and Images. GISS Surface Temperature Analysis, Analysis Graphs and Plots. New York, New York. Available online: https://data.giss.nasa.gov/gistemp/graphs/

Intergovernmental Panel on Climate Control. 2013. Fifth Assessment Report: Climate Change 2013. http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml

Mississippi's Best Management Practices Handbook – 4th Edition, September 2008. [online] URL: https://www.mfc.ms.gov/sites/default/files/Entire_bmp_2008-7-24_2.pdf

Mississippi Natural Heritage Program (MNHP). 2018. Data Request for species and ecological data through NatureServe Explorer. A program administered by the Mississippi Department of Wildlife, Fisheries, and Parks. Jackson, MS.

https://www.mdwfp.com/museum/seek-study/heritage-program/

National Academy of Sciences. 2008. Understanding and Responding to Climate Change: Highlights of National Academies Reports. Division on Earth and Life Studies. National Academy of Sciences. Washington, D.C. http://dels.nas.edu/resources/static-assets/materials-based-on-reports/booklets/climate_change_2008_final.pdf

NatureServe. 2018. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: July 3, 2018).

Public Law 93-622. P. 63.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey. Available online https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Accessed [01/18/2018].

Title 36, Code of Federal Regulations (CFR) Part 61. Title 36, Chapter I – Department of the Interior, Part 61 – Procedures for State, Tribal, and Local Government Historic Preservation Programs. http://www.ecfr.gov/cgi-bin/text-idx?SID=6dc7484527f272d5230e0106d4d6de57&mc=true&tpl=/ecfrbrowse/Title36/36cfr61_main_02.tpl

Title 40 Code of Federal Regulations (CFR) Parts 1500-1508 (1978, as amended). Title 40, Chapter V – Council on Environmental Quality, Parts 1500-1508. http://www.ecfr.gov/cgi-bin/text-idx?SID=c224960d3b75f2df1d20dc0885baf6c9&mc=true&tpl=/ecfrbrowse/Title40/40cfr1500_main_02.tpl

Title 43, Code of Federal Regulations (CFR) 3162 (1983). Title 43, Subtitle B, Chapter II, Subchapter C, Part 3160 - Onshore Oil and Gas Operations. http://www.ecfr.gov/cgi-bin/text-idx?SID=b7b3b34b270b94ba701af5bb866424d3&mc=true&tpl=/ecfrbrowse/Title43/43cfr3160_main_02.tpl

U.S. Census Bureau. 2016. State and County Quick Facts, Smith County, Mississippi. Retrieved June 2018 from https://www.census.gov/quickfacts/fact/table/smithcountymississippi,MS/PST045217

U.S. Code (16 USC § 470 et seq.). National Historic Preservation Act of 1966.

U.S. Code. (25 USC § 3001 et seq.). Native American Graves Protection and Repatriation Act.

U.S. Code. (30 USC §181 et seq.). Mineral Leasing Act of 1920.

U.S. Code. (42 USC § 1996 et seq.). Protection and Preservation of Traditional Religions of

Native Americans. 1996.

U.S. Code (42 USC § 7491(a)(1).25. Amendment to Clean Air Act of 1997 requiring Class I areas be kept free of manmade air pollution.

U.S. Department of Agriculture. U.S. Forest Service. August 2010. Lands Available for Oil and Gas Leasing Environmental Assessment. Available online. Accessed October 2017. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5210291.pdf

----- U.S. Forest Service. August 2014. Land and Resource Management Plan for the National Forests in Mississippi. Available online. Accessed October 2017. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3814664.pdf

U.S. Environmental Protection Agency (USEPA). 2011. Our Nation's Air: Status and Trends Through 2010. http://www.epa.gov/airtrends/2011

U.S. Fish and Wildlife Service. 1993. Yellow-blotched map turtle (*Graptemys flavimaculata*) recovery plan. U.S. Fish and Wildlife Service. Jackson, Mississippi. 18 pp.

----- 2003. Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan: *Second Revision*. U.S. Fish and Wildlife Service, Atlanta, Georgia, USA.

----- 2008. Birds of Conservation Concern. Available online. Accessed May 2018. https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf

----- 2011. Endangered and threatened wildlife and plants; 12-month finding on a petition to list the Gopher Tortoise as threatened in the eastern portion of its range. Federal Register 76(144):45130-45162.

van Dijk, P.P. 2011. *Graptemys flavimaculata.*(errata version published in 2016) The IUCN Red List of Threatened Species 2011: e.T9498A97418378. Downloaded on 20Nov2017. http://dx.doi.org/10.2305/IUCN.UK.2013.RLTS.T9498A12996484.en

Winters, F., J. D. Byrd Jr., C. T. Bryson. 2015. Mississippi's 10 Worst Invasive Weeds. Mississippi State University Extension Service Publication 1194-1.

APPENDIX A:
Table ES-1: Summary of anticipated environmental effects.

Resource	No Action Alternative	Proposed Action
Land Use	No impacts. Would result in the continuation of the current land and resource uses.	No direct impacts from leasing. Minor, short and long term changes to land use from reasonably foreseeable development activities due to conversion of undeveloped areas to areas that support potential future oil and gas development.
Noise/Visual Resources	No impacts. Would result in the continuation of the current land and resource uses.	No direct impacts from leasing. Minor, short and long term adverse noise and visual impacts possible from reasonably foreseeable development associated with the lease parcels. Noise levels would lessen during the production phase.
Socioeconomics and Environmental Justice	Loss, reduction, or delay of revenues generated through leasing and royalties.	Leasing would generate revenues to be shared with counties. Reasonably foreseeable development may generate additional royalties, economic stimulation in the form of additional employment, output, and support services. Environmental justice concerns are not expected.
Cultural Resources and Native American Interests	Would result in the continuation of the current land and resource uses. Potential impacts from "relic hunting", bulldozing, etc.	No direct impacts from leasing. Future surveys or consultation under the National Historic Preservation Act (NHPA) may be required at the APD stage to ensure that no impacts to cultural resources or Native American interests occur.
Mineral Resources	No impacts. Would result in the continuation of the current land and resource uses.	No direct impacts from leasing. Use and depletion of the resource would occur from reasonably foreseeable development.
Wastes	No impacts. Would result in the continuation of the current land and resource uses.	No direct impacts from leasing. Wastes would be generated from reasonably foreseeable development, with a potential for short and long term adverse impacts if wastes are not properly handled, stored, and disposed. Standard operating procedures (SOPs), best management practices (BMPs), and conditions of approval (COAs) at the APD stage would minimize risk from spills.
Air Quality	No impacts. Would result in the continuation of the current land and resource uses.	No direct impacts from leasing. Short and long term impacts due to emissions from construction equipment and fugitive dust from reasonably foreseeable development.

Resource	No Action Alternative	Proposed Action
Climate and Climate Change	No impacts. Would result in the continuation of the current land and resource uses.	No direct impacts from leasing. The proposed lease may contribute to the installation and production of new wells, which may consequently lead to an increase in greenhouse gas (GHG) emissions.
Soils	No impacts. Would result in the continuation of the current land and resource uses.	No direct impacts from leasing. Potential for minor adverse impacts to soils from future reasonably foreseeable development associated with clearing, filling, and grading activities.
Water Resources – Surface and Groundwater, Floodplains, Riparian Areas, and Wetlands	No impacts. Would result in the continuation of the current land and resource uses.	No direct impacts from leasing. Potential for minor adverse impacts to water resources located on the parcel from future reasonably foreseeable development. SOPs, BMPs, and COAs at the APD stage would minimize risk to groundwater and surface water from spills.
Natural Resources (Wildlife and Vegetation, Invasives/Exotics, Special Status Species, Migratory Birds)	No impacts. Would result in the continuation of the current land and resource uses.	No direct impacts from leasing since there would be no surface disturbing activities. Potential for minor adverse impacts to wildlife and vegetation associated with reasonably foreseeable development associated with clearing for wellpad and road construction due to habitat loss and modification. No adverse impacts to threatened or endangered species, or habitat suitable for these species, are anticipated. Other wildlife species, including migratory birds, would experience loss of habitat and potentially direct disturbance impacts from reasonably foreseeable future development. These impacts are not expected to cause population level impacts to any species, including migratory birds.
Public Health and Safety	No impacts. No action would result in the continuation of existing public health and safety conditions.	No direct impacts from leasing since there would be no surface disturbing activities. However, federal, state, and local regulations, as well as health standards and protocols ensure that potential operations do not compromise public health and safety.
Cumulative Impacts	No impacts. Would result in the continuation of the current land and resource uses.	Negligible to minimal cumulative impacts are anticipated.

APPENDIX B:
MAPS and PHOTOS

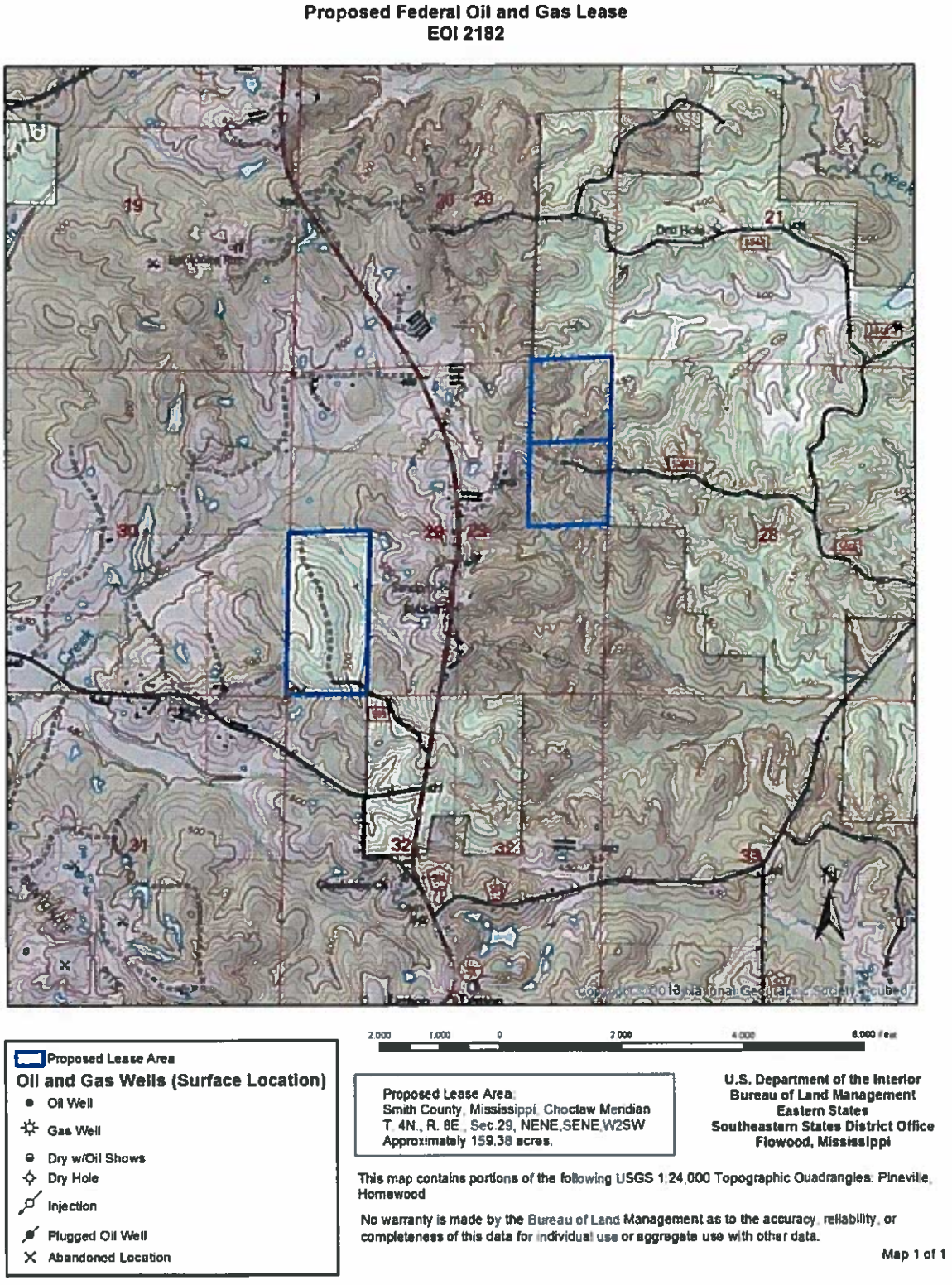

Figure 1-1. Topographic map of EOI #2182a.

Figure 3-1. Aerial view of EOI #2182a

Figure 3-2. Aerial broad view of EOI #2182a.

APPENDIX C: APPLICABLE NATURAL RESOURCE REGULATIONS, STATUTES, AND EXECUTIVE ORDERS

- NEPA (1969) and the associated Council on Environmental Quality regulations at 43 CFR Parts 1500-1508
- FLPMA (1976) as amended and the associated regulations at 43 CFR Part 1600
- Mineral Leasing Act (MLA) (1920), as amended and supplemented (30 USC 181),
- National Historic Preservation Act (NHPA) (1966) as amended and the associated regulations at 36 CFR Part 800
- American Indian Religious Freedom Act
- Native American Graves Protection and Repatriation Act
- Endangered Species Act (ESA) (1973) as amended
- Clean Water Act (CWA) (1977)
- Clean Air Act (1970) as amended
- Federal Onshore Oil and Gas Leasing Reform Act (FOOGLA)
- Migratory Bird Treaty Act (MBTA) (1918)
- Resource Conservation and Recovery Act (RCRA) (1976) as amended
- Executive Order (EO) 11988- Floodplain Management
- EO 119900 – Protection of Wetlands
- EO 12898 – Environmental Justice in Minority Populations and Low-Income Populations
- EO 13007 – Indian Sacred Sites
- Oil and Gas Leasing Reform – Land Use Planning and Lease Parcel Reviews (BLM WO IM 2010-117)

APPENDIX D: LEASE STIPULATIONS AND NOTICES FOR EOI #2182a.

STIPULATIONS

BLM

Cultural Resources and Tribal Consultation

Stipulation: This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. These obligations may include a requirement that you provide a cultural resources survey conducted by a professional archaeologist approved by the State Historic Preservation Office (SHPO). If currently unknown burial sites are discovered during development activities associated with this lease, these activities must cease immediately, applicable law on unknown burials will be followed and, if necessary, consultation with the appropriate tribe/group of federally recognized Native Americans will take place. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Endangered Species

Stipulation: The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. ' 1531 et seq., including completion of any required procedure for conference or consultation.

Exception: None

Modification: None

Waiver: None

Sensitive Plant Species

Stipulation (CSU): All suitable special status plant species habitat will be identified during environmental review of any proposed surface use activity. If field examination indicates that habitat of one or more of these species is present, the BLM will require a survey by a qualified

botanist for special status plants during periods appropriate to each species. Operations will not be allowed in areas where sensitive plants would be affected.

Objective: To protect threatened, endangered, candidate, proposed, and BLM sensitive plant species.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.
Modification: The stipulation may be modified if it is determined that a portion of the lease area does not contain sensitive plant species habitat.

Waiver: The stipulation may be waived if, based on field surveys, it is determined that the lease area does not contain sensitive plant species habitat.

Freshwater Aquatic Habitat

Stipulation (NSO): No surface occupancy or disturbance, including discharges, are permitted within 250 feet of a river, stream, wetland spring, headwater, wet meadow, wet pine savanna, pond, tributary, lake, coastal slough, sand bar, vernal pools, calcareous seepage marsh, or small, marshy calcareous stream. This buffer may be extended to 600 feet where the slope exceeds 10 percent and to protect vernal pools in southeastern Mississippi between Highways 98 and 59 providing suitable habitat for endangered Mississippi gopher frog.

Objective: To protect water quality of watersheds and natural stream substrate and morphology and to avoid potential impacts to federal and state-listed aquatic species.

Exception: An exception may be granted if the operator agrees to 1) span creeks and floodplains by attaching pipelines to bridges or 2) directionally drill under creeks, rivers, and other waters supporting listed species, 3) implement other measures developed in consultation with USFWS and coordination with state agencies.

Modification: The buffer may be reduced if the adjacent waterway has been surveyed for 100 yards upstream and 300 yeards downstream of the site, and results document the lack of suitable/occupied habitat for special status species within the mixing zone downstream of the project, as determined by BLM and USFWS.

Waiver: The stipulation may be waived if it is determined that the lease area has no hydrological connection to habitat of sensitive aquatic species.

LEASE NOTICES/BEST MANAGEMENT PRACTICES

Migratory Birds and Federally Listed Wildlife

Objective: To protect perch and roosting sites and terrestrial habitats for and to avoid potential impacts to migratory birds and federally listed wildlife.

Any reserve pit that is not closed within 10 days after a well is completed and that contains water must be netted or covered with floating balls, or another method must be used to exclude migratory birds.
All powerlines must be built to protect raptors and other migratory birds, including bald eagles, from accidental electrocution, using methods detailed by the Avian Power Line Interaction Committee (APLIC 2006)

Perching and Nesting Birds and Bats

Objective: To prevent birds and bats from entering or nesting in or on open vent stack equipment.

Open vent stack equipment, such as heater-treaters, separators, and dehydrator units, will be designed and constructed to prevent birds and bats from entering or nesting in or on such units and, to the extent practical, to discourage birds from perching on the stacks. Installing cone-shaped mesh covers on all open vents is one suggested method. Flat mesh covers are not expected to discourage perching and will not be acceptable.

Invasive and Non-Native Species

Objective: To discourage the spread of invasive, non-native plants.

Use of native or non-invasive plants in seeding mixtures will be encouraged to stabilize disturbed areas and during restoration activities. Construction sites will be surveyed for invasive species prior to ground disturbance. If invasive species are found, the proper control measures will be used to either eradicate the species from the area or minimize its spread to other areas. If cogongrass is found on site, equipment will be washed before exiting the site to prevent the spread of this highly invasive species to other locations. Post-construction monitoring for cogongrass and other invasive plant species should be conducted to ensure early detection control. In the case of split-estate lands, final seed mixtures will be formulated in consultation with the private landowner.

Pesticide Application

Objective: To protect the water quality of watersheds and natural stream substrate and morphology supporting special status species and their host species.

Any ground application of herbicides or other pesticides, sterilants, or adjuvants within 150 feet of listed species or habitat will require site-specific control measures developed in coordination or formal consultation with USFWS. No aerial application of herbicides or pesticides will be permitted.

APPENDIX E: AGENCY AND TRIBAL CORRESPONDENCE

MISSISSIPPI DEPARTMENT of ARCHIVES AND HISTORY

MDAH

HISTORIC PRESERVATION DIVISION
P.O. BOX 571
Jackson, MS 39205-0571
Phone 601-576-6940 Fax 601-576-6955
Website: mdah.ms.gov

3/19/18

March 15, 2018

Mr. Russ Long
Bureau of Land Management
273 Market Street
Flowood, Mississippi 39232-3348

RE: 8100 (020) JMS Smith Co. EOIs 2180, 2181, and 2182; Proposed lease for three wells on privately owned surface to access 358.42 acres of federal mining tracts. (BLM)
MDAH Project Log #02-111-18, Smith County

Dear Mr. Long:

We have received your February 22, 2018, letter regarding the above referenced undertaking, pursuant to our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800. We concur with the procedures for Section 106 compliance as described in your letter.

If you have any questions, please let us know.

Sincerely,

Hal Bell
Review and Compliance Officer

FOR: Katie Blount
State Historic Preservation Officer

RECEIVED
MAR 19 2018
By

Sullivan, John <j35sullivan@blm.gov>

[EXTERNAL] RE: 3 EOIs in Smith Co. MS; 8100 (020) JMS Smith Co. EOIs 2180, 2181, and 2182

Daniel R. Ragle <dragle@choctawnation.com> Fri, Mar 23, 2018 at 1:46 PM
To: "j35sullivan@blm.gov" <j35sullivan@blm.gov>

Thank you for the correspondence regarding the above referenced project. This project lies within our area of Historic Interest. We are unaware of any Choctaw historic/sacred sites located within the project's APE. In order to complete our review, we request a copy of the survey report, once one is completed. If you have any questions, please contact me by email.

Daniel Ragle

Compliance Review Officer

Historic Preservation Dept

Choctaw Nation of Oklahoma

(800) 522-6170 Ext. 2727

dragle@choctawnation.com

www.choctawnation.com

www.choctawnationculture.com

Choctaw Nation
Faith • Family • Culture

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mississippi Ecological Services Field Office
6578 Dogwood View Parkway, Suite A
Jackson, Mississippi 39213
Phone: (601)965-4900 Fax: (601)965-4340

June 25, 2018

IN REPLY REFER TO
2018-I-724

Mr. Jason Ross
Bureau of Land Management
411 Briarwood Drive, Suite 404
Jackson, MS 39206

Dear Mr. Ross:

The Fish and Wildlife Service (Service) has reviewed the information in your biological assessment dated June 6, 2018, regarding the proposed federal oil and gas lease project (TOI2182a) in Smith County, Mississippi. Our comments are submitted in accordance with the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Based on the information provided in your report, the Service concurs with your determination that the proposed project will have "no effect" on the gopher tortoise, red-cockaded woodpecker and yellow-blotched map turtle. No further consultation under the ESA is required with this office unless there are changes in the scope or location of the proposed project.

If you have any questions, please contact David Felder of our office, telephone: (601) 321-1131.

Sincerely,

Stephen M. Ricks
Field Supervisor
MS Field Office

MISSISSIPPI
DEPARTMENT OF WILDLIFE, FISHERIES, AND PARKS

Sam Polles, Ph.D.
Executive Director

June 18, 2018

Bureau of Land Management
Southeastern States District Office
273 Market Street
Flowood, MS 39232

Re: BLM EOI 2182a NHP Information Request
Smith County, Mississippi

R# 14292
EOI 2182a

To Jason Ross:

In response to your request for information dated June 4, 2018, we have searched our database for occurrences of state or federally listed species and species of special concern that occur within 2 miles of the site of the proposed project. Please find our concerns and recommendations below.

We do not currently have any records of rare, threatened, or endangered species or communities in the vicinity of your proposed project area. However, the quantity and quality of data collected by the Mississippi Natural Heritage Program are dependent on the research and observations of many individuals and organizations and, in many cases, this information is not the result of comprehensive or site-specific field surveys. In fact, most natural areas in Mississippi have not been thoroughly surveyed and new occurrences of plant and animal species are often discovered. Therefore, we recommend that best management practices be implemented to minimize any potential negative impacts resulting from this project.

Please feel free to contact us if we can provide any additional information, resources, or assistance that will help minimize negative impacts to the species and/or ecological communities identified in this review. We are happy to work with you to ensure that our state's precious natural heritage is conserved and preserved for future Mississippians.

Sincerely,

Nour Salam, Database Biologist
Mississippi Natural Heritage Program
(601) 576-6049
The Mississippi Natural Heritage Program (MNHP) has compiled a database that is the most complete source of information about Mississippi's rare, threatened, and endangered plants, animals, and ecological communities. The quantity and quality of data collected by MNHP are dependent on the research and observations of many individuals and organizations. In many cases, this information is not the result of comprehensive or site-specific field surveys; most natural areas in Mississippi have not been thoroughly surveyed and new occurrences of plant and animal species are often discovered. Heritage reports summarize the existing information known to the MNHP at the time of the request and cannot always be considered a definitive statement on the presence, absence or condition of biological elements on a particular site.

APPENDIX F: REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

Case File Number: EOI 2182a

Project Number:

Acres: 79.70

Location: Choctaw Meridian, Smith County, MS, T4N, R8E, Sec. 29, NENE, SENE,

I. Reasonably Foreseeable Development

A. RFD Baseline Scenario Assumptions and Discussion

Objective Horizons are the Jurassic Cotton Valley and Smackover between 14,500' and 17,500'. Principal objective is the Cotton Valley. Commodity is Crude Oil and associated Natural Gas.

Initial projection is for one (1) well to be drilled from one (1) well pad.

Federal acreage with be incorporated into a state determined drilling unit. Drilling and production units for oil are 160 acres. Units for Natural Gas are 640 acres or more. For a multi-well production area, Field Wide Units are initiated.

Nominated lands are located adjacent to or between a series of geologic structures on which several one and two well field have been developed.

The Oil and Gas Occurrence Potential is Moderate for both the Cotton Valley and Smackover. The Oil and Gas Development Potential is low for the Smackover and moderate for the Cotton Valley.

Based on prospect geology, both Federal and non-Federal wells could be drilled.

Wells are drilled vertically or with a slight deviation. Surface casing is run into the top of the Austin Chalk in order to protect USDW. Intermediate casing is generally run at some point in order to protect borehole integrity and other potential oil and gas zones.

A 30' wide well access road will be constructed consisting of a 16' wide travel surface with a 7' buffer on each side. Well pad size is approximately 600' X 550'.

If productive, multiple wells may be drilled from the existing pad.

If productive, oil and gas handling and production facilities will be constructed on the existing pad.

If productive, the reserve pit and part of the drill pad will be reclaimed when drilling and completion activities are concluded. The reserve pit size is estimated at 150' X 100'.

All disturbed acreage will be reclaimed if the well is non-productive.

A. Surface Disturbance Due to Oil and Gas Activity

Access Road: 1.03 acres (1500' X 30')

Well Pad & Pit: 7.58 acres (600' X 550')

Utility and/or Pipeline R.O.W: 0' – Use access road ROW

Initial Disturbance: 8.61 acres

Partial Reclamation of Drill Site: 0.34 acres

Net Disturbance for Productive Well: 8.27 acres

APPENDIX G: NATIONAL AMBIENT AIR QUALITY STANDARDS

Table. National Ambient Air Quality Standards.

	Primary Standards		Secondary Standards	
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**
Carbon Monoxide	9 ppm ($10\ mg/m^3$)	8-hour (1)	None	
	35 ppm ($40\ mg/m^3$)	1-hour (1)		
Lead	$0.15\ \mu g/m^3$ (2)	Rolling 3-Month Average	Same as Primary	
	$1.5\ \mu g/m^3$	Quarterly Average	Same as Primary	
Nitrogen Dioxide	53 ppb (3)	Annual (Arithmetic Average)	Same as Primary	
	100 ppb	1-hour (4)	None	
Particulate Matter (PM_{10})	$150\ \mu g/m^3$	24-hour (5)	Same as Primary	
Particulate Matter ($PM_{2.5}$)	$15.0\ \mu g/m^3$	Annual (6) (Arithmetic Average)	Same as Primary	
	$35\ \mu g/m^3$	24-hour (7)	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour (8)	Same as Primary	
	0.08 ppm (1997 std)	8-hour (9)	Same as Primary	
	0.12 ppm	1-hour (10)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Average)	0.5 ppm	3-hour (1)
	0.14 ppm	24-hour (1)		

Note:

(1) Not to be exceeded more than once per year.

(2) Final rule signed October 15, 2008.

(3) The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(4) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

(5) Not to be exceeded more than once per year on average over 3 years.

(6) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.

(7) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).

(8) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008).

(9) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(c) USEPA is in the process of reconsidering these standards (set in March 2008).

(10) USEPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.

APPENDIX H: MISSISSIPPI NATURAL HERITAGE PROGRAM (MNHP) RARE ANIMAL AND PLANTS LIST

Table. List of rare animal species documented to occur in Smith County by the MNHP and the availability of suitable habitat on the proposed tract.

Common Name	Scientific Name	State Rank	Global Rank	Suitable Habitat on Parcel
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	S1	G3T2	No
Natchez Stonefly	*Alloperla natchez*	S2	G2	No
Northern Bobwhite	*Colinus virginianus*	S3S4	G5	Yes
Alabama Spike	*Elliptio arca*	S1S2	G3Q	No
Rusty Blackbird	*Euphagus carolinus*	S2N	G4	No
Gopher Tortoise	*Gopherus Polyphemus*	S2	G3	Yes
Yellow-blotched Map Turtle	*Graptemys flavimaculata*	S2	G2	No
Pascagoula Map Turtle	*Graptemys gibbonsi*	S2	G2G3	No
Alabama Hickorynut	*Obovaria unicolor*	S1S2	G3	No
Florida Harvester Ant	*Pogonomyrmex badius*	S2	G5	No
Red Salamander	*Pseudotriton ruber*	S3	G5	No
Purple Pimpleback	*Quadrula refulgens*	S3S4	G3G4	No
Eastern Fox Squirrel	*Sciurus niger*	S3S4	G5	Yes
American Woodcock	*Scolopax minor*	S3S4N	G5	No
Black Bear	*Ursus Americana*	S1	G5	Yes

Table. List of rare plant species documented to occur in Smith County by the MNHP and availability of suitable habitat on the proposed tract.

Common Name	Scientific Name	State Rank	Global Rank	Suitable Habitat on Parcel
Ohio Buckeye	*Aesculus glabra*	S2	G5	Yes
Canada Wild Ginger	*Asarum canadense*	S3	G5	No
Prairie Milkweed	*Asclepias hirtella*	S2	G5	No
Tall Bellflower	*Campanula americana*	S3S4	G5	No
Wire Sedge	*Carex tenax*	S2	G5	No
Mullen Foxglove	*Dasistoma macrophylla*	S3S4	G4	No
Glade Fern	*Diplazium pycnocarpon*	S2S3	G5	Yes
Eastern Purple Coneflower	*Echinacea purpurea*	S3	G4	No
Horsetail Spikerush	*Eleocharis equisetoides*	S3S4	G4	No
Burning Bush	*Euonymus atropurpureous*	S2S3	G5	No
Blackfoot Quillwort	*Isoetes melanopoda*	S2	G5	No
Large Whorled Pogonia	*Isotria verticillata*	S3	G5	No
Carolina Anglepod	*Matelea carolinensis*	S3	G4	No
Climbing Milkweed	*Matelea obliqua*	S2	G4	Yes
Indian Cucumber Root	*Medeola virginiana*	S3	G5	Potential

Allegheny Spurge	*Pachysandra procumbens*	S3	G4G5	Yes
American Ginseng	*Panax quinquefolius*	S3	G3G4	Yes
Jacob's Ladder	*Polemonium reptans*	S2S3	G5	Yes
Boykin's Milkwort	*Polygala boykinii*	S3S4	G4	Yes
Oglethorpe Oak	*Quercus oglethorpensis*	S2	G3	Yes
Swamp Post Oak	*Quercus similis*	S3	G4	Yes
Lance-leaved Buckthorn	*Rhamnus lanceolata*	S2	G5	Yes
Needle Palm	*Rhapidophyllum hystrix*	S3	G4	No
Brownish Beakrush	*Rhynchospora capitellata*	S2S3	G5	Yes
Southern Beakrush	*Rhynchospora microcarpa*	S3S4	G5	Yes
Scarlet Woodbine	*Schisandra glabra*	S2	G3	Yes
Great Plains Ladies-tresses	*Spiranthes magnicamporum*	S2	G4	No
American Bladdernut	*Staphylea trifolia*	S3	G5	Yes
Silky Camelia	*Stewartia malacodendron*	S3S4	G4	Yes
Three Birds Orchid	*Triphora trianthophora*	S2	G3G4	No
Carolina Crownbeard	*Verbesina walteri*	S3S4	G4	No
Atamasco Lily	*Zephyranthes atamasca*	S3S4	G4G5T4	Yes

APPENDIX I: USFWS BIRDS OF CONSERVATION CONCERN (BCC)

Table 3-5. List of BCC found in the Southeastern Coastal Plain Region (EOI #2182a).

Common Name	**Scientific Name**	**Suitable Habitat Located on Parcel**
Red-throated Loon	*Gavia stellata*	No
Black-capped Petrel (nb)	*Pterodroma hasitata*	No
Audubon's Shearwater (nb)	*Puffinus lherminieri*	No
American Bittern (nb)	*Botaurus lentiginosus*	No
Least Bittern	*Ixobrychus exilis*	No
Roseate Spoonbill (nb)	*Platalea ajaja*	No
Swallow-tailed Kite	*Elanoides forficatus*	No
Bald Eagle (b)	*Haliaeetus leucocephalus*	No
American Kestrel (*paulus* ssp.)	*Falco sparverius*	No
Peregrine Falcon (b)	*Falco peregrinus*	No
Yellow Rail (nb)	*Coturnicops noveboracensis*	No
Black Rail	*Laterallus jamaicensis*	No
Limpkin	*Aramus guarauna*	No
Snowy Plover (c)	*Charadrius alexandrinus*	No
Wilson's Plover	*Charadrius wilsonia*	No
American Oystercatcher	*Haematopus palliatus*	No
Solitary Sandpiper (nb)	*Tringa solitaria*	No
Upland Sandpiper (nb)	*Bartramia longicauda*	No
Whimbrel (nb)	*Numenius phaeopus*	No
Long-billed Curlew (nb)	*Limosa haemastica*	No
Marbled Godwit (nb)	*Limosa fedoa*	No
Red Knot (*rufa* ssp.)(a)(nb)	*Calidris canutus*	No
Semipalmated Sandpiper (Eastern)(nb)	*Calidris pusilla*	No
Buff-breasted Sandpiper (nb)	*Tryngites subruficollis*	No
Short-billed Dowitcher (nb)	*Limnodromus griseus*	No
Least Tern (c)	*Sternula antillarum*	No
Gull-billed Tern	*Gelochelidon nilotica*	No
Sandwich Tern	*Thalasseus sandvicensis*	No
Black Skimmer	*Rhynchops niger*	No
Common Ground-Dove	*Columbina passerine*	No
Chuck-will's-widow	*Caprimulgus carolinensis*	Yes

Common Name	Scientific Name	Suitable Habitat Located on Parcel
Whip-poor-will	*Caprimulgus vociferous*	Yes
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Yes
Loggerhead Shrike	*Lanius ludovicianus*	Potential
Brown-headed Nuthatch	*Sitta pusilla*	Yes
Bewick's Wren (*bewickii* spp.)	*Thryomanes bewickii*	No
Sedge Wren	*Cistothorus platensis*	No
Wood Thrush	*Hylocichla mustelina*	Yes
Blue-winged Warbler	*Vermivora cyanoptera*	Yes
Black-throated Green Warbler	*Dendroica virens*	Yes
Prairie Warbler	*Dendroica discolor*	No
Cerulean Warbler	*Dendroica cerulean*	No
Prothonotary Warbler	*Protonotaria citrea*	No
Swainson's Warbler	*Limnothlypis swainsonii*	No
Kentucky Warbler	*Oporornis formosus*	No
Bachman's Sparrow	*Peucaea aestivalis*	No
Henslow's Sparrow (nb)	*Ammodramus henslowii*	No
LeConte's Sparrow (nb)	*Ammodramus leconteii*	No
Nelson's Sharp-tailed Sparrow (nb)	*Ammodramus nelson*	No
Saltmarsh Sharp-tailed Sparrow (nb)	*Ammodramus caudacutus*	No
Seaside Sparrow (c)	*Ammodramus maritimus*	No
Painted Bunting	*Passerina ciris*	Potential
Rusty Blackbird (nb)	*Euphagus carolinus*	No

Note: (a) - ESA candidate, (b) - ESA delisted, (c) - non-listed subspecies or population of threatened or endangered species, (nb) - non-breeding in this Bird Conservation Region. Source: U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. [Online version available at http://www.fws.gov/migratorybirds/]

APPENDIX J: ACRONYMS AND ABBREVIATIONS

ACRONYMS AND ABBREVIATIONS

APD	Application for Permit to Drill
APLIC	Avian Power Line Interaction Committee
AQI	Air Quality Index
BCC	Birds of Conservation Concern
BLM	Bureau of Land Management
BMP	Best Management Practices
C°	Celsius
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_{2e}	Carbon Dioxide equivalent
COA	Condition of Approval
CSU	Controlled Surface Use
CWA	Clean Water Act
°F	Fahrenheit
dB	Decibel
dBA	A-weighted decibel
DOI	(U.S.) Department of the Interior
E	East
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EOI	Expression of Interest
ES	Executive Summary
ESA	Endangered Species Act
Et al.	Latin phrase et alia meaning "and others"
Et seq	Latin phrase et sequentes meaning "and the following"
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
FOOGLA	Federal Onshore Oil and Gas Leasing Reform Act
GHG	Greenhouse Gas
GIS	Geographic Information System
H_2S	Hydrogen Sulfide
HAP	Hazardous Air Pollutant
HFC	Hydrofluorocarbon
HV	High-Volume
IM	Internal Memo
IPCC	Intergovernmental Panel on Climate Change
MBTA	Migratory Bird Treaty Act
MDEQ	Mississippi Department of Environmental Quality

MDWFP	Mississippi Department of Wildlife, Fisheries, and Parks
MLA	Mineral Leasing Act
MNHP	Mississippi Natural Heritage Program
MOGB	Mississippi Oil and Gas Board
MOU	Memorandum of Understanding
MSU	Mississippi State University
N	North
NAAQS	National Ambient Air Quality Standards
Nb	Non-breeding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
N_2O	Nitrous Oxide
NO_x	Nitrogen Oxides (generic for air pollutants – NO and NO_2)
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NRHP	National Register of Historic Places
NSO	No Surface Occupancy
NWR	National Wildlife Refuge
O_3	Ozone
Pb	Lead
PFC	Perfluorocarbon
PL	Public Law
$PM_{2.5}$	Particulate Matter
PM_{10}	Particulate Matter
PPB	Parts per Billion
PPM	Parts per Million
PSD	Prevention of Significant Determination
RCRA	Resource Conservation Recovery Act
RFD	Reasonably Foreseeable Development
ROW	Right of Way
S	South
SEC	Section
SF	Sulfur Hexafluoride
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMZ	Streamside Management Zone
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SPCC	Spill Prevention Control and Countermeasure
STAR	(EPA's) Science to Achieve Results program
Std	Standard
Tg	Metric Ton
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Officer
T.R.S.	Township, Range, Section
US	United States

USACE	United States Army Corp of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compound
W	West
WA	Wilderness Area
WMA	Wildlife Management Area
WO	Washington Office